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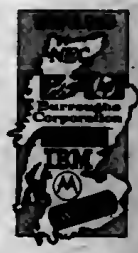

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AT&T tariff draws fire

Users blast proposed discontinuance penalties on voice-grade private-line circuits

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — Communications users groups have voiced strong objections to changes proposed by AT&T in its private-line tariffs.

Under one AT&T proposal submitted recently to the Federal Communications Commission, a user ordering nine or more voice-grade, private-line circuits could be charged as much as $1,036 per circuit if he canceled the order before service began. If the user discontinued the service less than one year after it began, the penalty could total $1,125 per circuit.

Under the other proposal, AT&T established new termination charges for its interstate voice-grade and Accunet T1.5 services. In each case, services that include local access would cost more than they do now, while those not including such access would cost less.

Objections to both proposals were filed with the FCC this month by the International Communications Association, representing many of the nation's major corporate communications users. Also opposing the proposed cancellation and discontinuance penalty charges was the Ad Hoc Telecommunications Users Committee, another group composed of business communications users.

The revised private-line termination charges, if authorized by the FCC, would go into effect Nov. 10, according to AT&T staff manager Doreen Gleason. The present termination charge for a voice-grade private

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Price, software, delivery delays hamper IBM XT/370 acceptance

By Paul Korzeniowski
CW Staff

Handicapped by late deliveries, slow software development and a high price tag, the IBM Personal Computer XT/370 is experiencing difficulty securing a niche in most data processing departments.

That was the finding of *Computerworld* interviews with IBM Personal Computer XT/370 value-added resellers and MIS managers.

The microcomputer was introduced in October 1983, and shipments began in June 1984. The XT/370 provides a user with IBM's PC-DOS and VM operating systems, 256K bytes of random-access memory, up to 4M bytes of virtual memory and 10M to 20M bytes of hard disk storage.

Since its announcement, approximately half a dozen software vendors have revealed plans to tailor their mainframe packages to the XT/370. While the XT/370 can download and run most packages designed for IBM's VM operating system, some software suppliers are fine-tuning their wares to the microcomputer's features.

Although this fine-tuning should be a relatively simple task, few vendors have completed it. They blamed shipment delays that left many without an XT/370 to test and forced them to alter original target dates.

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DP's newest fiefdom: micro support centers

By Paul Korzeniowski
CW Staff

They go by many names — microcomputer support centers, corporate computer stores, information centers. No matter what they are called, they have two things in common: They are the latest addition to the typical data processing department, and they were spawned by a common need.

The common need is user support. "Users expected the same level of support for microcomputer products that they received from office automation suppliers," said Sally Huss, assistant vice-president at Manufacturers Hanover Trust Co. in New York.

While support may have been expected, it was not forthcoming, she added. So corporations are assuming the support role and are building central microcomputer support facilities. "It is more cost-effective to build a central facility than to have support costs duplicated by various departments," said Kevin O'Donnell, a vice-president at Manufacturers Hanover, which operates two support centers at its New York offices.

> *'Once [he knows] how to use the micro, he asks, "How do I build a data base?"'*
> — Vita A. Cassese, Pfizer, Inc.

The size and purpose of these facilities differ by corporation. Generally, the facilities combine features of a classroom and a computer store. At Manufacturers Hanover, for example, the information center is divided into three sections. One section contains a number of microcomputers and a small conference table. A second area houses software and training displays. Managers' offices are located in the third area.

While each facility's purpose differs, they all seek to introduce microcomputer capabilities to employees. "Employees walk into the store after seeing an advertisement on television," said Joseph Cersky, systems manager at Travelers Insurance Co.'s support facility in Hartford, Conn. "Often, they may not know a great deal about microcomputers."

To help employees learn about microcomputers, Pfizer, Inc.'s microcomputer center at its New York office sponsors a two-day "Introduction to Microcomput-

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NEWSPAPER

Nixdorf unveils mini

Micro 7 extends low end of 8870 line

WALTHAM, Mass. — Nixdorf Computer Corp. last week announced the 8870 Micro 7, a low-end addition to its 8870 line of minicomputers.

The unit is based on a proprietary Nixdorf microprocessor and comes with 256K bytes of main memory and a 5¼-in., 800K-byte floppy disk drive. A 10M-byte hard disk drive is also included, the vendor said.

The Micro 7 can simultaneously support two workstations: a master and a slave, the vendor said. The unit reportedly, can also accommodate two workstation printers. Printers available with the Micro 7 include 100 or 150 char./sec models, a 210 char./sec ink-jet model and a 40 char./sec letter-quality unit.

According to Nixdorf, the Micro 7 uses the Nixdorf Interactive Real-Time Operating System (Niros) and is software-compatible with larger members of the 8870 line. While users of other members of the 8870 line have the option of field upgrading to larger models, the Micro 7 is not field-upgradable, a spokeswoman said.

The unit features Nixdorf's Terminal Automatic Monitoring Operator System (Tamos), which reportedly controls and logs work performed on the system and automatically handles data backup. The Micro 7 uses the same versions of Niros and Tamos used on larger 8870 models, according to the spokeswoman.

The Micro 7 offers roughly the same processing power as the 8870 Model 15, but cannot support as many users or as much storage, the spokeswoman said. The Model 15 reportedly can support up to eight terminals and can accommodate 64M bytes of disk storage and 512K bytes of random-access memory. Other members of the 8870 line include the Models 35, 55 and 55.

Software packages written in Business Basic can be used on the 8870 Micro 7, according to the vendor. These include the vendor's Comet applications package, which includes financial and production modules, and the vendor's Loan Management Information System, designed to handle consumer loans.

Nixdorf is also offering a remote support network for the Micro 7 that maintains and updates application and operating systems software and hardware. Customers with more than one 8870 system can use the remote facility for transmitting internal program modifications, the vendor said.

The 8870 Micro 7 costs $6,995 for a basic system including 256K bytes of random-access memory, a 10M-byte fixed media disk drive and a 800K-byte floppy disk drive. It is available immediately.

Nixdorf is located at 300 Third Ave., Waltham, Mass. 02154.

NCR Unix-based Tower XP boasts 50% power hike

FRAMINGHAM, Mass. — NCR Corp. today unveiled a high-end version of its Tower supermicrocomputer, the Tower XP, which is said to offer 50% more power than the original Tower 1632 announced two years ago.

Designed to use AT&T's Unix System V, the Tower XP can support a maximum of 16 users. An NCR spokesman noted, however, that the XP is capable of supporting eight to 12 users with no degradation. The Tower 1632 also can support a maximum of 16 users, but the spokesman said it can support between four and eight users with no degradation.

The XP's operating system is said to include the University of California at Berkeley 4.2 Unix utilities. The unit also features a serial I/O controller utilizing a Motorola, Inc. 68010 processor with 128K bytes of random-access memory, which is intended to off-load the central processor for better performance, the company said. In addition, the XP reportedly features a processor memory controller that incorporates the central processor, 4K-byte page registers and a 2K-byte cache memory.

All software that runs on the 1632, which was designed to use AT&T's Unix System VII, will run on the XP, the company said. The 1632 can be upgraded to an XP with the purchase of an upgrade kit costing $4,900, an NCR spokesman said.

The XP was designed as a high-end additon to the Tower line and is aimed at the same commercially oriented audience as the 1632.

NCR currently does not plan to market the XP to scientific or computer-aided design and manufacturing applications, a spokesman said.

The XP includes the same industry standard interfaces as the Tower 1632, including a 5¼-in. Seagate Technology, Inc. interface and 8-in. storage module device disk drive interfaces, Intel Corp.'s Multibus interface and a ¼-in. cartridge tape drive interface. The XP also features networking capabilities, including IBM's Systems Network Architecture and X.25 compatibility, the company said.

The XP comes in a standard configuration of 1M byte of main memory, 46M bytes of disk storage and a 45M-byte cartridge tape drive. The XP can be expanded to 8M bytes of error-correcting memory and 260M bytes of unformatted disk storage, according to NCR.

The price for a typical XP configuration with eight serial ports, one parallel port and the operating system is $19,495; it is available immediately, the company said. The price of a standard 1632 remains at $11,495.

NCR is located at 1700 S. Patterson Blvd., Dayton, Ohio 45479.

CORRECTIONS

Computerworld's editorial of Oct. 8 should have stated that, in addition to Storage Technology Corp. and Memorex Corp., both Amdahl Corp. and National Advanced Systems Corp. also provide IBM-compatible mainframe peripherals.

A footnote on a chart outlining Burroughs Corp.'s A3 line of mainframes [CW, Oct. 15] incorrectly implied that the purchase prices listed for the A3 line were base prices. The listed prices include disk and tape storage and a printer. Also, because of incorrect information supplied by the vendor, the maximum number of channels available on the A3 line is incorrect. The maximum is eight channels.

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Two executives will share first prize in the Society for Information Management's 1984 Paper Competition/24

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NEWS

Lawyers must assume teaching role in computer trials

Judge urges expert witnesses, detailed presentations to explain computerese to court

By James Connolly
CW Staff

BOSTON — Attorneys and expert witnesses in computer-related lawsuits have the responsibility to educate judges and juries as well as present their cases, according to a Massachusetts trial court judge.

Recalling the several computer-related trials over which he has presided, Massachusetts Superior Court Judge William G. Young offered his advice here last week to 50 New England lawyers active in computer litigation.

"I wish you would think of yourselves as teachers. Take a complex, scientific subject and teach it as well as possible. You've also got to have witnesses who can teach," Young warned. He compared the lawyer's need to explain a case to jurors and judges, whom he described as "one-man juries," to a journalist's ability to explain a technical subject to a reader. The lawyer's "fair translation" of technical terms need not sacrifice advocacy, said Young, who acknowledged that judges are laymen in the computer field.

Jury trials

Young, a veteran state court judge awaiting U.S. Senate approval of his appointment to a U.S. District Court judgeship, noted that only a fraction of all legal disputes, including computer cases, progress to a jury trial. But, he said, all cases have to be prepared with that possibility in mind.

Trial preparation involves using a full range of demonstrative aids, such as charts and enlarged photographs that illustrate, for example, what a microchip is, rather than just having a chip available for the jury to view.

Young warned the attorneys that they and their vendor and user clients should keep in mind two trends in case law: expansion of the law of *res judicata* and greater use of judicial estoppel.

'Res judicata'

Expansion of *res judicata* — which prohibits trying the same issue twice — means that litigants who let an arbitrator decide a seemingly minor case to save legal expenses may regret that decision when they later try to file a major case based on the same issue.

He said judges are refusing to hear the latter cases because the issues have already been decided.

Greater use of judicial estoppel — which prevents a litigant from taking opposing positions in similar cases — would be a factor in cases where companies sue to block spin-off firms, which, when successful a few years later, try to bar their own employees from starting spin-offs.

XT/370 from page 1

Of the few who have ported their software, only one — Mathematica Products Group, Inc. in Princeton, N.J. — reported that an MIS department had purchased the microcomputer.

A number of reasons were cited why the machine has not captured the fancy of many MIS managers. First, it is rather expensive, with an $11,560 price tag for a 20M-byte system and an $8,995 price for the 10M-byte system. "The machine would be much more attractive if it was half the price," said Dennie Nielson, MIS manager at North American Life & Casualty Co., an insurance company in Minneapolis.

Performance problems were listed as another deterrent to XT/370 sales. "The machine runs eight to 10 times slower than a mainframe," said Kevin Winkler, senior consultant at Economic Sciences Corp., a Berkeley, Calif., software house. "If it takes 10 to 15 seconds to process data on the mainframe, it will take several minutes on the XT/370."

Yet users seem satisfied with the machine's performance. "When we purchased the machine, we were warned that it would be slow," remarked Richard Zambell, director of economic research at Weiss Research, Inc. in West Palm Beach, Fla. "Generally, we've been satisfied with the machine's response time. The only time there is a problem is when one tries to print."

Nielson added, "The machine performs well as a text editor, but can run a little slow when paging." Paging refers to the technique of reading data from real (RAM) to auxiliary (hard disk) storage.

Limited storage capacity was also cited as an XT/370 shortcoming. "When we load the operating system and [Mathematica's Ramis, a high-level language and data base management system,] onto the system, we fill the hard disk," maintained Earl Evans, manager of tax technical systems at Occidental Life Insurance Co. in Los Angeles.

> *'We tried to attach a tape backup system to the machine but were unable to get it to work. No one at IBM or the tape manufacturer seems to know why that happened. We are a month behind schedule because we can't seem to get around the storage problem.'*
>
> — Earl Evans, manager of tax technical systems at Occidental Life Insurance Co.

"We tried to attach a tape backup system to the machine, but were unable to get it to work. No one at IBM or the tape manufacturer seems to know why that happened. We are a month behind schedule because we can't seem to get around the storage problem."

Another limitation is that the machine supports only one user. "We would prefer it if the machine was multitasking," stated Wil Crandall, executive vice-president of DHI Dairy, Inc., a Provo, Utah, software vendor.

While struggling for data processing department acceptance, the Personal Computer XT/370 seems to be enjoying some success as a turnkey system for vertical market applications. For example, DHI Dairy tailored a version of its IBM 4341 mainframe dairy management system for the XT/370. Crandall claimed that farmers see the product as a cost-effective alternative to purchase of a mainframe.

Using a Horizon/370, a turnkey forecasting system from Chase Decision Systems in Cambridge, Mass., Zambell built a model of the U.S. economy that used 450 equations. "We explored various options," Zambell maintained. "We looked at a time-sharing system that would cost us approximately a million dollars a year, and microcomputer systems were not powerful enough for us. The Horizon system represented our best alternative."

Some of the XT/370's limitations could be overcome if IBM introduced a similar model with the new IBM Personal Computer AT, observers noted. "With the AT's powerful processor, this system would be able to handle more users and store more data," Crandall claimed. "I don't know if IBM plans to do this, but I think it is a good idea."

Nielson noted, "This is not the end of the line for this type of machine; rather, it is a first step."

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Early users praise Smart Link, call for enhancements

By Paul Gillin
CW Staff

When Mallory Timers Co. in Indianapolis started using Lotus Development Corp.'s 1-2-3 for budgeting last year, it found there was still one logjam in the stream of productivity benefits — data entry.

"We were keying data in from general ledger reports, checking it against the report and then rekeying if there were errors," said Bill Vogt, manager of data processing. "Budgeting was still taking two to three months to complete.

"When I saw [GE Software International Corp.'s] Smart Link, I saw the possibility of using it to get data out of the [Software International] general ledger for totaling and modeling on the [IBM Personal Computer] and then uploading it to the general ledger again."

Useful in budgeting

Mallory, which became a beta test site for Smart Link, was one of two early users of the product interviewed recently by *Computerworld*. Mallory has installed two copies of Smart Link and has used it for budgeting this year with solid success, Vogt said. Not only does the link enable users to skirt the process of data entry, but it also allows them to spot irregularities in general ledger data by extracting fields into the 1-2-3 spreadsheet for comparison, he said.

Home Box Office Television (HBO) in New York, which was another early Smart Link user, has installed about 20 copies of the package to tie micros into a Software International general ledger. Smart Link is used basically for financial reporting by people in the financial operation, according to Dave MacLean, manager of financial information services at HBO.

Downloading involves calling up Smart Link menus to define accounts and fields to download. "It will chase down multiple account levels, or you can define individual accounts," MacLean said. Screens are also used to indicate where in the Lotus spreadsheet the data is to be placed, he added.

The definitions can then be stored while the user logs on to IBM's CICS, he explained. Once the logon is completed, the user returns to Smart Link and invokes the download procedure. Smart Link essentially initializes a CICS query, pulls up a screen, copies the data and downloads it into the spreadsheet. He said it also performs two levels of validation: determining whether the account exists and whether the user has access through his password.

Mallory's Vogt said Smart Link requires some up-front installation time to define maps and tables. However, once the tables are defined, "it's very fast," he said.

MacLean praised Smart Link's screens and editing abilities, which he said are similar to those of a full screen editor. He said the product is very easy to use and can be installed on a Personal Computer in 15 minutes or less. "We're really expecting it to take off as the word gets around," he added.

Mallory's Vogt likened the Smart Link menus to those of 1-2-3. "The menus are well-detailed and all in color," he said. "They follow the Lotus philosophy so that anyone who's familiar with Lotus can use it."

Among the nice features of Smart Link are its screen orientation, its documentation and the limits it imposes on how many accounts can be downloaded, MacLean said. "It prevents someone from trying to download your entire general ledger," he noted.

Improvements, additions needed

Both users cited some features they would like to see improved or added to future Smart Link releases. MacLean said Smart Link can be used to download data, but not relationships between general ledger accounts. For that reason, HBO has chosen not to do budgeting with Smart Link. "It basically dumps the data down one line at a time as it exists on the mainframe," he said. "To add up accounts automatically, you still have to go into Lotus."

For budgeting, HBO uses SAS Institute, Inc.'s FScalc mainframe spreadsheet within the SAS/FSP product. "FScalc allows you to program in Cobol or SAS to provide certain formulas and establish relations between the data," MacLean said. "Lotus just didn't meet our needs for budgeting."

MacLean said he would like to see Smart Link enhanced to allow relationships between accounts to be downloaded. He said he would also like to eliminate the necessity to convert data from Software Arts, Inc.'s Data Interchange Format into Lotus format after it has been downloaded from the mainframe.

Vogt said Mallory has had some problems with slow transfer rates. He said one download of 55 accounts took nearly 35 minutes to execute. But he noted that the problem may be in CICS and not in Smart Link.

A spokesman for Software International said the performance problem was probably environment-related. Regis Kaufman, manager of product marketing, said Smart Link typically achieves transfer rates of between 10 and 20 records per minute.

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DEC single-user workstation aimed at technical users

MAYNARD, Mass. — Digital Equipment Corp. last week introduced the Vaxstation I, the company's first 32-bit single-user workstation. Based on the firm's Microvax I, the system reportedly will provide VAX resources, including high-resolution graphics and multiwindowing capabilities, to scientists, engineers and other technical personnel.

DEC predicted that typical applications for the new workstation would include computer-aided design and manufacturing, laboratory data analysis, process control and software development.

The Vaxstation I is "a full member of the VAX family," able to run a wide range of currently available software, said Norman Tripp, DEC product manager. He also emphasized the workstation's ability to link to other VAX systems in a distributed processing environment through Decnet/Ethernet networking.

"There's a very strong demand in our customer base for 'my own VAX,'" Tripp claimed, adding that the demand is part of a general shift toward distributed processing and away from time-sharing. "We're seeing an evolution from the generation when engineers queued up for a very expensive resource to get three hours starting at 2 a.m.," he remarked.

DEC's single-user workstation, the Vaxstation I.

New window manager and graphics system software has been integrated into the Micro VMS operating system specifically for the Vaxstation I, according to DEC. The workstation reportedly supports the Graphical Kernel System (GKS) standard as its first graphics application interface language.

A starting configuration includes the CPU with 1M byte of random-access memory (RAM), 1K by 2K bytes of bit-mapped video RAM, a model RX50 400K-byte, 5¼-in. diskette drive, a model RD52 31M-byte hard disk drive, monitor and mouse. Licenses for the Micro VMS operating system and workstation software are standard, as is the GKS interface, DEC said.

The Vaxstation's 19-in. monochrome monitor is said to feature a 60-Hz noninterlaced display with resolution of 960 by 864 pixels. The display shows full-page documents and multiple windows concurrently, with both DEC VT100 and Tektronix, Inc. 4014 terminal emulation.

Options include an additional 1M byte of RAM, a Decnet/Ethernet interface and additional VAX/VMS software products, the vendor said.

Prices for the Vaxstation I begin at $21,095. Shipments of the product are scheduled to begin in December.

DEC is located in Maynard, Mass. 01754.

Bank's speech synthesizers greet financiers' calls with daily balance

By Edward Warner
CW Staff

BOSTON — When corporate finance managers call the Shawmut Bank of Boston's Cash Management Services Department each morning, the voice that greets them — slightly nasal and metallic — is like music to their ears.

The voice the finance managers hear is the cash management department's speech synthesizer telling them their firm's exact account balance — the figure upon which their day's investment and check-writing decisions will be based.

Previously, the finance manager might have gotten a busy signal, as his call competed with the many other calls — 600 to 700 a day — coming into the department with the same request. Now, according to Peter Galligan, Shawmut Bank's assistant vice-president for corporate services, each incoming call from the 60 corporate customers using the service is routed to one of six speech synthesizers linked to a Digital Equipment Corp. PDP-11/70 minicomputer.

The call is answered immediately by the Dectalk speech synthesizer, also from DEC, and after the customer passes user number and password screening, the synthesizer gives him his balance as recorded on the PDP-11/70.

'Computeresque' but clear

The voice is "computeresque" but clearly spoken, Galligan said, and is remarkable because it is the only case of synthetic speech being used anywhere by a bank for account balance inquiries. Other banks, he explained, use digitized speech, which he said is kind of impersonal and requires someone to act first as a narrator, speaking the words upon which the system will build its vocabulary.

The Dectalk system, he continued, needs no narrator and can be programmed for any of three male or three female voices. It can also speak with an accent and can be programmed to use only that accent when addressing a particular customer. He said the system is being considered for eventual use in a banking-by-phone program, which would allow outlying stores in a retail chain to punch in their night's deposits on a telephone keypad and have the stores' total deposits accumulated into the account of the chain's corporate owner by morning.

Aside from offering a service that some customers find attractive, Galligan said, Shawmut Bank benefited from the Dectalk system because it freed the department's employees from the burden of answering hundreds of daily telephone calls, most of which came just after the bank opened.

Units connected in parallel

Shawmut Bank's Dectalk system consists of six Dectalk synthesizers, each about the size of a typewriter and connected in parallel to a telephone line. When a call comes in and meets a busy signal at one unit, it is automatically transferred to the next unit in line. So far, Galligan said, most calls have gone no further than the second-in-line unit.

Shawmut Bank was one of the three first users of the Dectalk system, which was announced late last year. In the first quarter of this year the bank implemented a pilot program with one Dectalk unit serving 20 customers. The additional five Dectalk units were added in August, and, Galligan said, the system grew to its current 60 customers without any marketing by the bank.

During the pilot project, Galligan elaborated, users were given the option of having a male or female synthetic voice greet them each morning, but the customers had no preference.

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DPMA conference set for Nov. 4-7

ANAHEIM, Calif.— A conference with exhibitions and workshops for business information managers, sponsored by the Data Processing Management Association (DPMA), will take place Nov. 4-7 at the Disneyland Hotel and Convention Center here, with optional postconference workshops on Nov. 8.

Prices vary. One full day is not more than $175, full meet price is not more than $415, and postconference workshops range from $65 to $90.

More information is available from DPMA, P.O. Box 1091, Park Ridge, Ill. 60068.

Air-to-ground service lets air travelers phone home

By John Dix
CW Staff

OAK BROOK, Ill. — Beginning last week, passengers aboard several airlines found an oddity in their airborne cabins: pay telephones.

Culminating nine years of research and development, Airfone, Inc. last week went on-line with a national air-to-ground telephone service that is initially available on 20 aircraft.

The brainchild of John D. Goeken, founder of Microwave Communications, Inc. — now MCI Communications Corp. — and several other communications companies, Airfone, based here, is equally owned by Goeken Communications, Inc. and Western Union Corp., which bought into the company in 1981.

The service is presently available on carriers from Delta Air Lines, Inc., Trans World Airlines, Inc., United Airlines, Inc., American Airlines, Inc., Northwest Orient Airlines, Inc. and Republic Airlines, Inc., but will be expanded to other airlines as the wrinkles are ironed out and as demand dictates.

Users of the new service will be able to place calls, but not receive them because of airline fears that incoming calls would turn flight attendants into telephone operators. The service has a flat rate of $7.50 for the first three minutes and $1.25 for each additional minute, regardless of call destination.

System components include radio and telephone gear in the aircraft, a nationwide network of unmanned ground stations configured in a cellular fashion and central billing and monitoring computer hardware.

To use the service, customers insert a major credit card into one of typically four telephone stations on the aircraft. These stations validate the expiration date of the customer's card, register billing information then release a cordless handset that the caller can use anywhere on the plane, explained Sandra K. Goeken, director of corporate affairs for the company.

When a call is placed, an on-board computer uses a patented process to search for the weakest usable pilot signal being broadcast by a ground station in front of the plane. Calls cannot be passed from one ground station's area of coverage, or cell, to another. By seeking a station in front of the plane, the maximum possible call duration is ensured. Goeken said that, depending on the plane's location, calls can be supported for up to 40 minutes.

Ground stations carry a complement of 900-MHz radio gear to communicate simultaneously with several aircraft at frequencies approved by the Federal Communications Commission for this service. Other ground station equipment includes antennae, power supplies and a 10Mbyte Winchester disk drive, according to John A. Dandre, director of electronic data processing for the company. Additionally, each of the 49 ground stations will have roughly 10 dial-up telephone lines.

When a call is placed, the user's billing information is transmitted to a ground station, where it is stored on disk. The call is then routed through the dial-up switched telephone network to its destination. Each night, Airfone's Digital Equipment Corp. VAX-11/730 polls each ground station over dial-up lines at 300 bit/sec and copies the billing information. This data is later processed and sorted into individual tapes that are forwarded to the appropriate credit card company.

At the end of each month, Airfone divides the revenues with the airlines, whose percentage cut depends on a sliding scale based on the volume of traffic carried.

In the future, it is anticipated that the Airfone service will be used for data communications, enabling travelers with portable computers to access data bases or send and receive electronic mail. Goeken said that he has talked to several terminal manufacturers about this, but noted that each vendor hoping to market devices for use on aircraft needs Federal Aviation Administration approval.

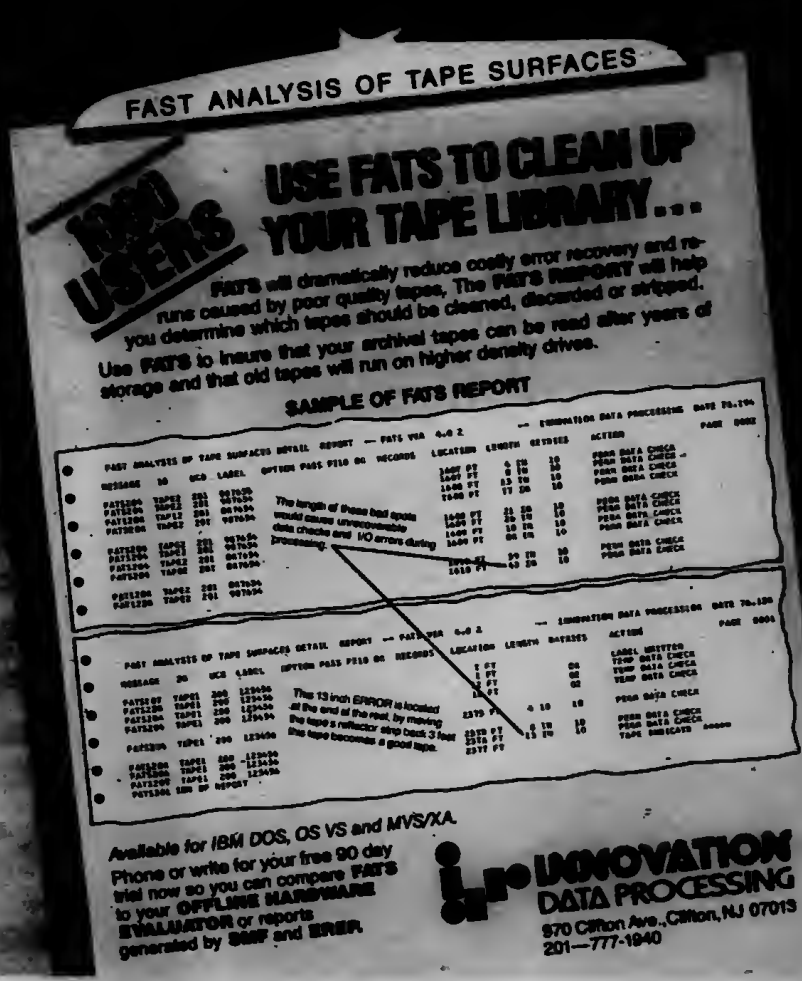
Prime cuts price of OA system

NATICK, Mass. — Prime Computer, Inc. last week cut the price of its entry-level 50 series Model 2250 superminicomputer by 18% to 25%. The company also cut by 25% the price of a 1M-byte memory expansion board used on some of its systems.

The 2250 now ranges in price from $29,900 to $52,400. It features from 512K to 4M bytes of main memory and can support up to 32 terminals and up to 128 interactive processes. The 2250 uses the firm's Primos operating system.

The 1M-byte memory board, the MMW1-E9, is the standard add-on memory product for the 50 series line. It uses transistor-to-transistor logic memory chips and a four-layer printed-circuit board. Its price has been reduced from roughly $10,000 to $7,900.

Prime is located at Prime Park, Natick, Mass. 01768.



CW photo by P. Hamerlowski

Manufacturers Hanover Trust staffers (from left to right) Sally Hune, Peter Hull, Kevin O'Donnell and John Philips.

SUPPORT from page 1

ers" seminar. At Travelers, where 1,300 users have been trained, two types of classes are held. "One seminar is designed to overcome the fear of using a personal computer," Ceresky said. "If the person is afraid of making mistakes in front of other people, there is also a self-study course available."

Needs determined

Formal training sessions are supplemented with consulting by store personnel at Manufacturers Hanover. "The [employee] usually does not know what he wants or what is available when he walks into the center," said Peter Hull, assistant manager at the Manufacturers Hanover center. "My job is to determine his needs and match them to our tools. Sometimes, I may recommend our time-sharing system rather than a personal computer package."

Peter Hull

CW photo by P. Hamerlowski

Test-drive a micro

When a personal computer is recommended, Travelers encourages the employee to take a loan computer to his department or home before deciding on the purchase. "The loaners are similiar to test-driving an automobile," Ceresky noted.

If the employee decides to purchase the program, the facilities play a role in the purchase process. At Manufacturers Hanover, Hull helps the user draft a letter to justify the purchase to senior management. A program he authored helps the user determine the cost of a particular configuration.

Justifying purchase

Pfizer's facility requires that the user write a letter answering basic questions about why a microcomputer is needed. "It ensures that the person has thought through the purchase process before he asks for the microcomputer," said Vita A. Cassese, director at Pfizer's Pharmaceutical Systems Division.

Before the computer arrives, the user has to be trained at the support facility. Manufacturers Hanover has a complete series of on-line tutorials for all packages it supports. Travelers, Manufacturers Hanover and Pfizer offer courses in popular packages, such as Lotus Development Corp.'s 1-2-3.

Postpurchase support usually consists of store personnel answering technical questions. "At first, the user asks, 'How do I install this package?' " Cassese said. "Once the person understands how to use the microcomputer, the [next] question asked is 'How do I build a data base?' "

While the facilities offer a wide range of services to users, it is difficult to discern how the services translate into revenue.

"We do not cost-justify our investment in microcomputers," Cassese maintained. "We just believe that they are tools that should be used."

IBM-British Telecom net plans axed

LONDON — British Telecom's would-be joint venture with IBM to develop a countrywide data network here was officially axed by the British government last week (10/16).

The proposal from the UK's state-run telephone company and the American computer giant was rejected by Britain's Ministry for Trade and Industry, which felt that the combined strength of the two organizations would stifle competition in the emerging value-added network services marketplace.

Because of IBM's substantial contribution to the UK economy, it was said to be difficult for the government to rebuke the company's network proposal.

It is thought that IBM will soon obtain a special license to run its proprietary Systems Network Architecture (SNA)-based network.

However, with the collapse of the joint venture, British Telecom's public-switched network, Packet Switch Stream, will be left to compete against the SNA network.

IBM rolls out high-end additions to Series/1 minis

RYE BROOK, N.Y. — IBM gave a boost to its Series/1 line of minicomputers with two high-end additions — the 4956 Model E and 4956 Model 60E — which are said to offer 50% more internal performance than the previous top-of-the-line 4956 Model B. IBM cut the price of the Model B by $2,000 and dropped the memory upgrade price on the Series/1 line by as much as $1,250.

The 50% performance improvement was made possible by an enhanced processor card, which an IBM spokesman described as a fine-tuned version of previously used processor cards. Also, for the first time, IBM said it will allow Series/1 users to upgrade in the field to the newly announced models. Series/1 processors were previously not field-upgradable, a spokesman said.

The 4956 Model E, and the integrated disk model, the 60E, offer from 512K to 2M bytes of main storage, twice as much as was available on the 4956 Model B. The main memory on the newly announced systems can be expanded in 256K- or 512K-byte increments. IBM said the price for a 512K-byte memory increment has been reduced from $5,000 to $3,700. A 256K-byte memory enhancement was reduced from $2,500 to $1,875, IBM said.

IBM to supply software

The increase in memory capacity also doubles the addressable memory capacity of the newly announced Series/1 models from 512K to 1M bytes. The spokesman said IBM plans to supply software to take advantage of the extended addressable memory. Current Series/1 programs will run without modification on the newly announced systems, IBM said.

The Models E and 60E (which includes an integrated 60M-byte disk drive) will be available in January. The Model E with 512K bytes of main memory costs $16,500.

The Model 60E with 512K bytes of main memory costs $27,600. Users of the 4956 Model B can upgrade to the Model E for $3,200. Users of the 4956 Model 60D can field upgrade to the Model 60 E for the same price.

IBM said the price of the 4956 Model B has been reduced from $14,500 to $12,500, a reduction of $2,000.

IBM also said the purchase price for the 4968 tape drive, used with the Series/1, has been increased from $8,250 to $8,800. The monthly maintenance charges for the 4964 diskette and 4969 magnetic tape units were increased from 8% to 10%, IBM said.

The announcement was made through IBM's Information Systems Group, located at 900 King St., Rye Brook, N.Y. 10573.

AT&T from page 1

line — AT&T calls it a station charge — is $36.05 per month. Under the proposed tariff, it would rise to $39.65 per month. If the customer obtained local access separately, however, he would pay $20 per month.

Accunet T1.5 termination charges would also be revised; the charge for a termination with local access, now $312 per month, would increase to $336, while the charge without local access would be $60.

The proposed cancellation and discontinuance charges were designed to recover costs that AT&T has incurred because of the private-line service order backlog that has developed since divestiture Jan. 1, Gleason said. Customers, she added, have been placing duplicate orders and then canceling the extra ones when their needed services were turned on.

The cancellation/discontinuance penalty will become effective Nov. 11 if the FCC approves it. The key details of AT&T's proposal are:

- The penalty would apply only to those customers who ordered nine or more private-line circuits activated within the same calendar month.
- The customer could cancel up to eight circuits and prematurely discontinue another eight within a year without being assessed a penalty.
- No penalty would be assessed if AT&T failed to provide service by the scheduled date.
- If the customer ordered a temporary circuit — for 30 days or less — he would be liable for a cancellation penalty but not a discontinuance penalty.
- The full cancellation penalty ($1,036 per circuit) would be assessed if a user canceled five days or more before service was scheduled to begin. The penalty would decrease as the interval between notification and scheduled start-up date increased.

The two user groups contended that despite these qualifications, AT&T's proposal does not protect private-line customers sufficiently.

A spokesman for the ICA said that AT&T's present private-line rates, as well as charges for connecting local special access circuits, are likely to be revised before the end of this year, and the latter changes will cause further changes in AT&T's private-line rates. As a result, "the commission should not permit [AT&T Communications] to make even piecemeal changes of the type proposed here" until the underlying tariffs are stabilized, he argued.

Just published:

MVS TSO

Concepts • Commands • SPF • CLIST

If you're developing programs under OS/MVS, you're probably using some type of time-sharing system. If that time-sharing system is TSO, a new book called *MVS TSO* is for you. It zeroes in on the tasks a programmer has to do most often, so you can master TSO in a hurry.

Here's what you'll learn, whether you're using native TSO or SPF (a menu-driven version of TSO)

- how to create or change a data set or a library member
- how to allocate, display, print, rename, delete, move, or copy a data set
- how to compile, link-edit, and execute a program interactively
- how to debug a COBOL program interactively—that is, how to monitor the program's execution, look at the contents of data fields, watch the order in which subprograms execute, and so on
- how to start and control background processing for batch jobs (a background job doesn't run in your time-sharing region, so your terminal's not tied up as the job executes)
- why you have to use native TSO commands for some functions even if SPF is available on your system

In short, you'll learn everything you need to know to use TSO commands or SPF for program development.

For experienced TSO users: How to use command procedures

MVS TSO will also teach you how to use command procedures, or CLISTs. A CLIST is a series of TSO commands and statements that are executed in sequence (it's roughly equivalent to a JCL procedure). In this book, then, you'll find out:

- how to create and execute a simple CLIST for a specific job
- how to create and execute a generalized CLIST that can be used in a number of situations
- how to write a complex procedure that uses facilities much like those of a high-level language
- when and why you should write a program in a high-level language instead of using a CLIST

2 reasons why this book works

1. A technical subject like TSO is easier to master if you have plenty of practical examples to study. That's why *MVS TSO* is loaded with illustrations. For example, you'll find:

- before-and-after screen images that show you what values to enter into a screen and what the result will be
- TSO command formats that clearly explain each operand
- sample CLISTs
- schematic drawings that show how TSO works and how it relates to MVS

These illustrations not only help you understand TSO in the first place. They also serve as handy references when you're working at your terminal.

What's more, they teach you the basic patterns of TSO commands and SPF options. So you won't have any trouble looking up new features in the IBM manuals or other references when...and if...you need them.

2. This book is organized in a way we've found works well. After chapter 1 (an introduction to MVS and TSO), the book is divided into 3 parts: one each on SPF, TSO commands, and CLIST. So if SPF isn't available at your installation, you can skip that part and concentrate on native TSO. If you already have TSO experience, you can go directly to the part on CLIST.

In other words, you can study the parts you want to, when you want to.

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NEWS

WASHINGTON UPDATE

Congress approves bills affecting high-tech mart

WASHINGTON, D.C. — In the last few days of the 98th Congress, the legislators gave final approval to several measures that affect high-technology industries, including trade policy and data communications:

■ Congress completed work on a huge trade bill that requires the president to encourage high-technology exports, gives the president five-year authority to eliminate duties on certain high-technology products (such as semiconductors) and makes clear that duty-free trade arrangements for developing countries will hinge on such factors as the beneficiary nation's treatment of U.S. exports, intellectual property rights and investment.

■ Congress approved a bill that partially deregulates the cable television industry, but it allows cable operators to provide two-way data service only when regulated by the Federal Communications Commission.

■ Congress approved, as part of the anticrime package, a measure that provides strong federal penalties for intentionally trafficking in counterfeit goods, such as personal computers, and knowingly using a counterfeit trademark.

Social programs gain aid of computer data bases

WASHINGTON, D.C. — Congress, in the closing days of its 1984 session, approved several pieces of separate legislation authorizing new computer data bases to aid in social programs.

■ Congress created an Organ Procurement and Transplantation Network to use computers for matching donated organs with needy individuals [CW, July 9].

■ Congress gave final approval to a Vocational Education Act that provides grants for programs to train workers for high-technology jobs and creates a national data base to track vocational education programs.

■ Congress authorized creation of a national data base on arthritis, musculoskeletal and skin diseases to increase knowledge about the ailments and to identify individuals who have a high risk of developing the diseases. In addition, the legislators authorized continued operation of the International Cancer Research Data Bank and created a new Council on Health Care Technology.

National robotics research program OKed

WASHINGTON, D.C.— Congress recently approved a national robotics research program that will create a federal research center at the National Bureau of Standards (NBS), provide research and education grants and establish centers to study modern manufacturing technologies.

The Manufacturing Sciences and Robotics Research and Development Act was given final approval by the U.S. House of Representatives on Oct. 4 as part of the NBS budget for fiscal 1985. The Senate had approved the package in late September.

The legislation contained these major provisions:

■ It authorized up to $20 million in grants for basic research on robotics and up to $5 million in financial aid for education and training.

■ It established a Federal Research Center on Robotics and Automated Manufacturing at NBS for the development of standards (such as interfaces for integrated robotics systems) and research on systems integration, reliability and performance.

■ It authorized up to $15 million for establishing regional research centers to conduct applied research on robotics and other advanced manufacturing technologies.

■ It authorized about $10 million for a two-year study on the affect of automated manufacturing on workers and established a 12-member advisory committee on manufacturing technology.

The legislation was supported by the Robotic Industries Association (RIA), a trade group in Dearborn, Mich. [CW, Aug. 20]. Donald Vincent, RIA executive vice-president, said the federally funded research will take some of the research load off of U.S. robot makers, who are facing tough competition from Japan.

The legislative package also authorized $10 million for the NBS Institute for Computer Science and Technology [CW, Aug. 20] and $500,000 for the U.S. Department of Commerce to increase the availability of Japanese science and engineering literature to U.S. scientists.

Federal excise taxes to go to Treasury by way of EFT

WASHINGTON, D.C. — The U.S. Bureau of Alcohol, Tobacco and Firearms recently implemented a new law that requires federal excise taxes on alcohol and cigarettes to be remitted to the U.S. Department of the Treasury via electronic funds transfer (EFT).

The bureau said it was implementing the Deficit Reduction Act of 1984, which requires the alcohol and tobacco industries to use EFT for excise tax remittances if the company's gross tax liability equals or exceeds $5 million a year.

The move is expected to save the government $8 million a year because EFT will place money in the Federal Reserve Bank of New York three to four days faster than paper check transactions, enabling the government to collect interest sooner, according to a bureau official.

The bureau explained that the transfer would occur from the taxpayer's commercial bank to the federal bank using the Federal Reserve System's Fedwire communications system.

SEC eyes computerized brokerage systems

WASHINGTON, D.C. — The emergence of computerized brokerage systems, in which investors are linked through personal computers to securities brokers for making on-line investments, is being monitored closely by the Securities and Exchange Commission (SEC) to prevent regulatory abuses.

In a policy statement published last week, the SEC said it supports the development of these automated systems for trading stocks and options, which ordinarily is done by telephone. At the same time, however, the commission warned operators of the computer brokerage systems to comply with SEC regulations that protect investors.

The SEC said the systems should indicate last-minute changes in securities prices and should ensure the privacy and security of customer accounts. Because the broker has less contact with the investor, brokers should make an extra effort to supervise their customers' trading activities and ensure that customers have the financial qualifications to make the investments, the SEC said.

ICCP extends test deadline

CHICAGO — The deadline for registration for two examinations of the Institute for Certification of Computer Professionals (ICCP) has been extended to Nov. 2. The tests are for the ICCP's Certificate in Data Processing (CDP) and for its Certificate in Computer Programming (CCP).

The deadline was extended because the institute has appointed a new test administrator. Both tests will be offered Dec. 8 at sites around the world.

The CCP test is priced at $95. The CDP exam is priced at $120. Additional information and instruction manuals are available from the ICCP, Suite 1762, 35 E. Wacker Drive, Chicago, Ill. 60601.

DP association names president

BETHESDA, Md. — The National Association of Free-Lance Programmers (NAFLP) has appointed Dr. Robert B. Samworth as president and editor-in-chief of its newsletter, "Software Market Letter."

NAFLP, founded in 1982, is designed to provide free-lance programmers with information about how and where to sell original software. Membership fees, which cover the cost of the newsletter, are $58 per year.

NAFLP can be reached through P.O. Box 5797, Bethesda, Md. 20814.

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DJC

NEWS

Recent computer crime legislation viewed as first step

DP leaders feel government may expand law to deal with private sector computer crime

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — Leaders in the data processing community last week said they view the recent enactment of federal computer crime legislation, which mostly covers government computers, as an important first step that needs to be expanded next year to include private sector computers used in interstate commerce.

"A first step is better than no step at all. The inertia has been overcome, but it's far from an optimum step," commented Richard Cashion, assistant director of data processing at Tennessee Technological University in Cookeville, Tenn.

Cashion, who is chairman of the Data Processing Management Association's committee on computer crime, said Congress needs first to define computer crime properly and then expand the statute to cover the computer crimes that affect interstate commerce.

Earlier this month, Congress hastily enacted computer crime amendments attached to the continuing budget resolution [CW, Oct. 15]. The amendments make it a federal crime to gain unauthorized access to data stored in computers used by the federal government or to financial data protected by federal privacy statutes.

As reported, a compromise between House sponsors of H.R. 5616 and the Senate resulted in the deletion of provisions protecting computers used in interstate and foreign commerce.

Cashion said many DP managers want federal legislation to cover crimes that are unique to the computer age, such as theft of data and software, that are not outlawed by other statutes. Federal jurisdiction is appropriate for crimes affecting interstate commerce, he said, which includes data communications over interstate telephone lines.

Referring to the need to define computer crime carefully and to obtain better statistics, Cashion remarked, "It's like nailing Jell-O to the wall — we don't have a firm idea of what we're trying to legislate against."

William R. Moroney, president of the Electronic Funds Transfer Association, said he was delighted by passage of the measure. "There was serious concern that Congress would not enact anything this year . . . and that would send a very damaging message," he said.

> *'It's like nailing Jell-O to the wall — we don't have a firm idea of what we're trying to legislate against.'*
> — Richard Cashion, Tennessee Technological University.

Moroney observed that the provision covering financial data provides a balancing of penalties, since the financial institutions themselves would be penalized under existing law if they released the protected information.

Robert S. Willard, vice-president of government relations for the Information Industry Association (IIA), said he welcomed news that Congress put "something on the books" that specifically mentions computer crime. "It was about time Congress took some action to get it through the legislative pipeline," he said.

But Willard expressed disappointment that the measure was limited to government and government-related data bases, leaving IIA's members — who operate private information services — without federal protection. But he noted that key House and Senate legislators have vowed to hold hearings early next year on expanding the new law, "so this is only the beginning," he said.

Willard also commented on the way Congress attached the crime bill to a budget resolution passed just before adjournment, calling the process a travesty.

"It's a little bit disappointing that our government works this way," he concluded, after watching the legislative action from the Capitol galleries and on cable television.

Pushed by Rep. William J. Hughes (D-N.J.), chairman of the House subcommittee on crime, H.R. 5616 moved easily this summer to the House floor, where it was approved unanimously. But then it ran into Sen. Paul Laxalt (R-Nev.), Hughes' counterpart in the Senate, who indicated he wants more careful study of the issue next year.

In late September it seemed the bill would die on Laxalt's desk. But when the House and Senate sat down to reach a compromise on the budget resolution, Hughes insisted that it include the House-passed computer crime bill, aides said.

Faced with Laxalt's continued reluctance, Hughes opted for a compromise that discarded provisions of H.R. 5616 covering business computers and retained those covering government computers. The compromise budget resolution that emerged from the House-Senate conference, including the remaining computer crime amendments, was passed by the House Oct. 10 and by the Senate Oct. 11.

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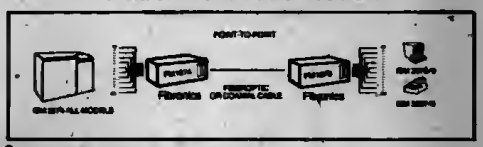

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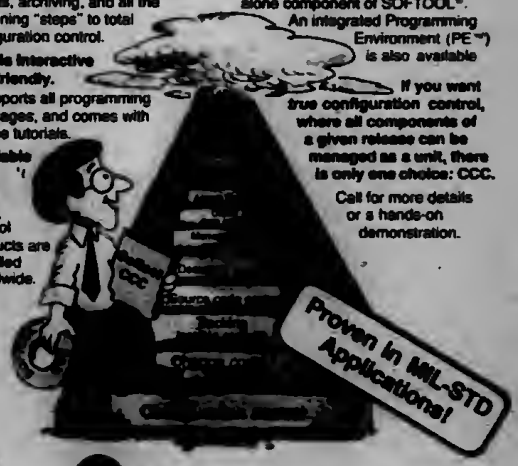

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MSA's scrapped micro venture seen as mart barometer

By Paul Gillin
CW Staff

ATLANTA — Management Science America, Inc.'s (MSA) decision to put its retail microcomputer software business on the auction block should have little effect on current mainframe customers and may, in fact, help rid the company of the earnings doldrums that have plagued it for more than a year.

However, MSA's failure to overcome the prolonged earnings slump of its micro subsidiary points to the ineffectiveness of mainframe software sales techniques in the volatile micro market. MSA's move may prompt circumspection from other mainframe software vendors considering moves into the micro arena.

Those were among the reactions of analysts and observers interviewed by *Computerworld* here following MSA's recent announcement that it plans to sell or spin off its retail micro software business. The move primarily affects Peachtree Software, Inc., the business software subsidiary that MSA acquired three years ago. MSA's three-year foray into that market has been fraught with difficulties, owing in part to recent weakness in that market and to MSA's self-confessed difficulties in running two different software businesses profitably.

When it released preliminary earnings estimates for the third quarter ended Sept. 30, MSA admitted, "The prime factor in the company's loss [of approximately 11 cents per share] was the performance of its retail microcomputer software subsidiary." MSA now estimates its earnings per share for the year will be below the 63 cents earned in 1983.

MSA Executive Vice-President Dennis Vohs said it has become increasingly difficult for the company to juggle the interests of micro and mainframe businesses when the two are trying to appeal to different audiences. "There's just not enough common strategy between the two," Vohs said.

"We have situations in which we give our employees bonuses twice a year, and this year with the [micro] market down, we didn't give those bonuses," Vohs said. "Since the [Peachtree] people are part of MSA, it's hard to single them out. It's those kind of conflicts and strategies that made us think the retail side could do better on its own."

Vohs

MSA has already been approached by companies interested in acquiring parts of Peachtree, Vohs said, but he declined to name any of the companies. Vohs also said that IBM's recent 30-package entry into the microcomputer software arena [CW, Oct. 1] had no impact on MSA's decision.

MSA has reaffirmed its intentions to continue selling Peachlink, its micro-mainframe communications software product, and to provide links between MSA's mainframe software and Peachtree products. Furthermore, Vohs said, jettisoning Peachtree's retail business would not necessarily mean that the company would stop selling Peachtree software.

"In the corporate area, we will continue to sell, and we are doing a lot of activity in this area," Vohs said. MSA reportedly has set up a micro distribution division as a prototype to test the viability of large-scale distribution. However, Vohs said, nearly 100% of Peachtree's revenues currently come from retail sales. He said MSA would not make a long-term commitment to sell Peachtree products.

Analysts were largely unshaken by the announcement. "They needed to do something with the business — either shore it up or get out of it," said Kenneth Burke, an analyst at Alex. Brown & Sons, Inc. "It was a different business from their core strengths in commercial and industrial-type marketing on their mainframe products. They just couldn't take the strengths in one and apply them to the other area."

Burke said MSA will probably be more successful selling Peachlink and other products that relate to its traditional business. "You are not going to find, in my estimation, the mainframe vendors successful in selling micro products unless they can provide some leverage through their mainframe sales force," he said.

Burke estimated MSA would show a year-to-date before-tax operating loss of $12.2 million, of which more than $10 million would be attributable to Peachtree.

Curt Monash, an analyst with Paine Webber, Inc., said the decision to cast off the retail software operations makes sense for MSA.

"The size of the Peachtree organization either required hit products or a consistent level of success; it had neither," Monash said. "Peachtree had its successes, but [it] didn't have that consistent level."

Monash said MSA could be the next software company to exceed annual revenues of $1 billion "if the management team pulls together." Robert Anastasi, a vice-president at Robinson-Humphrey/American Express Co. in Atlanta, admitted some surprise at the extent of Peachtree's troubles, noting that the company followed sound marketing practices. "[It was] shooting for breadth of products, and your basic business sense tells you you'd rather have your revenues derived from a number of products," he said. "Peachtree's strategy seemed to make a lot of sense."

Anastasi proposed that the MSA decision could have positive long-term implications for the company. Noting that MSA stock fell only 1½ points in the two days following the Oct. 11 announcement, he said, "I think investors were encouraged by the fact that MSA recognized the problem and that there was some action taking place.

"Peachtree in a sense took investors' eyes off the ball," he continued. "MSA is really a mainframe computer software company." Although returning to the mainframe business will slow MSA's growth rate, it should maintain the firm's long-term viability, he said.

Peter Bartolik, Computerworld's senior editor of computer industry, also contributed to this report.

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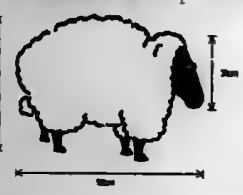

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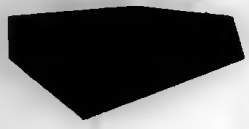

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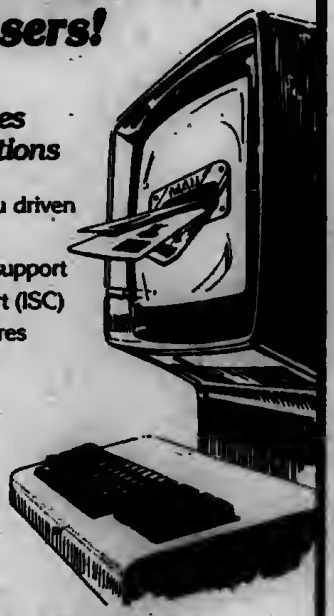

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Users look to Unix as new solution to an old problem

AT&T's operating system wins kudos for transportability, flexibility

CW AT UNIX EXPO

By Charles Babcock
CW New York Bureau

NEW YORK - "I'm a frustrated end user," said Ralph I. Squire, an educational director at the Rochester Institute of Technology, voicing a complaint aired by many at Unix Expo in New York last week.

Those attending the three-day trade show on AT&T's operating system were often looking for a new solution to an old problem — a shortage of computing power for their application. And they were looking to Unix for a solution, usually with the help of their MIS departments — but sometimes without it.

Squire helped run 150 seminars at the Rochester, N.Y., school last year without the aid of a computer. He wants to update his mailing list of conference attendees, compare mailing lists and do targeted mailings.

But his mailing list software cannot perform these functions, even after being rewritten from a program for a Xerox Corp. Sigma 7 to one for the IBM 360, again for the IBM 370 and twice more through succeeding IBM mainframes.

"It will cost us more to update the program again than it would to buy a new system," he explained. If he can get a small, multiuser Unix system, the mailing list will be updated one more time and become transportable to future mainframes, he said.

"We're trying to get away from the back-office environment," said Joel W. Miller, an analyst at the investment house of Lazard Freres & Co. in New York, who was shopping for an intraoffice Unix system with which investment analysts could do spreadsheet functions and graphics.

Lazard Freres' marketing staff cannot perform the financial modeling it wants to on the in-house IBM languages, and its data processing capacity is already split between company computers and time-sharing.

So Miller is shopping for a Unix system that will give his marketing staff its own capability to make quick presentations to customers — money managers, pension fund managers and other institutional investors. He plans to buy a system before the end of the year.

At the venture capital firm of Enventure Capital Group in Buffalo, N.Y., company officials are so impressed with their office Unix system that they are looking for start-up Unix software firms in which to invest.

Unix system links offices

Gregory C. Koch, vice-president for both in-house information processing and software investment, said his firm uses a Unix system to tie together three offices in different states.

Installed on a Convergent Technologies, Inc. Megaframe superminicomputer, Convergent's Unix System Five allows employees working at different locations to do spreadsheet, accounting and portfolio management tasks and then exchange data with the home office.

"We have a small data processing department," Koch explained. With just one programmer and one data entry clerk, it was important that non-DP professionals be able to learn the basics of the system, he added.

Enventure was willing to invest in a Unix system because Convergent "is working very closely with AT&T, and [AT&T is] a company that can stay around until the next century," he said.

At Link Flight Simulation division of Singer Co. in Binghamton, N.Y., Gould, Inc. is installing a pilot Unix system for top administrators and their staff. Although Link's data processing is done on IBM mainframes, Unix already had a foothold among the engineers at the site who were familiar with Perkin-Elmer Corp.'s licensed version. Some engineers urged that Unix be enlisted for an administrative decision support system, said Gould's Dennis F. Larson, and Link's management information services director agreed.

An MIS supervisor will set up the Unix environment in which a cluster of eight terminals will run data base management programs, electronic mail, electronic calendars and spreadsheet calculating, according to Gould's Richard A. Painter. A Gould PS 3000 file server and applications processor along with PT 100 smart terminals will make up the hardware. Because it is Unix-based, the system will be able to communicate with the IBM mainframe system, too, Painter said.

Operating system of the future

Although some attendees at the conference criticized the lack of business programming in Unix, several program developers said they had concluded that Unix was the operating system of the future and had started work on applications programs a year or 18 months ago.

One developer, Clifford N. Cary of Creare R&D, Inc. in Hanover, N.H., said Unix "has got five years, at least, as an industry standard." Cary said he has reservations about Unix because the different versions have trouble communicating with one another.

Unix is also getting a boost from the National Aeronautics and Space Administration, which had contracted with Mitre Corp.'s Houston division to rewrite space shuttle and other programs in Unix.

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Memory, support should top Unix buyer's checklist

CW AT UNIX EXPO

By Charles Babcock
CW New York Bureau

NEW YORK — The AT&T Unix operating system offers hardware independence to users who adopt it, but finding the version of Unix that is right for you may prove difficult, said a Unix marketing expert last week.

Ray A. Jones, compiler of the "Unix Software Directory" and owner of Onager Publishing of San Jose, Calif., told a seminar at the Unix Expo in New York last week that the Bell Laboratories operating system "comes in 28 flavors."

William J. Klinger, business planning manager for AT&T Technologies in Summit, N.J., later said that AT&T is making a major effort to establish Unix System V as an industry standard.

But buyers also have System III, Version 6 and Version 7 from Bell Labs, plus two versions, 4.1 and 4.2, published by Berkeley Software Distribution, Berkeley, Calif. In addition, independent software developers have their own licensed versions, although none of them are allowed to use the name Unix, Jones said.

Amdahl Corp., Digital Equipment Corp., IBM and 126 other hardware manufacturers listed by Jones all sell versions of Unix, and each will catalog the Unix software that runs on its equipment, he said.

Moving toward System V

Those interested in a Unix system should first determine the version of Unix they wish to use, Jones said. Version III was the first one that AT&T would support. Most manufacturers are now moving toward System V, he added.

The 1976 Version 6 is used on some large mainframes, while the Berkeley versions offer numerous embellishments and enhancements. "Of the 129 manufacturers that I know of, only six use Unix from Berkeley Software Distribution," Jones said.

System V, however, has more Berkeley enhancements than Version 7, he added.

The top three sellers of Unix systems in 1983 were Altos Computer Systems, Inc., Radio Shack Corp. and Fortune Systems Corp., Jones said. Klinger said he has seen figures indicating AT&T will be among the top three in 1984, its first year of postbreakup operation.

For such purposes as real-time data acquisition or industrial control, only two or three versions of Unix are available. One is produced by Charles River Data Systems, Inc. of Framingham, Mass., and another is made by Masscomp Co. of Littleton, Mass., Jones said.

Response time will also dictate what type of hardware a buyer gets. Unix systems require large amounts of memory to store the operating system. Jones uses a Callan Data Systems, Inc. processor with 21M bytes of disk drive storage. The Unix system with applications programs take up 16M bytes, he said.

Beware of the amount of advertised storage on a hard disk system, he warned. Vendors like to talk about unformatted space; after formatting, a 10M-byte disk drive may have 8.4M bytes.

When shopping for a disk drive, try to find one with the shortest average access time. They range from 18 to 190 msec.

A buyer should look beyond his initial purchase to see what support exists for the system.

Does the seller have a 24-hour 800-Wats telephone number that users can call for support? Does the manufacturer acknowledge that it is still trying to get bugs out of the software and that it will make upgraded versions available? Does the manufacturer publish a newsletter on the product? Is there a users group? What kind of system training is available to users?

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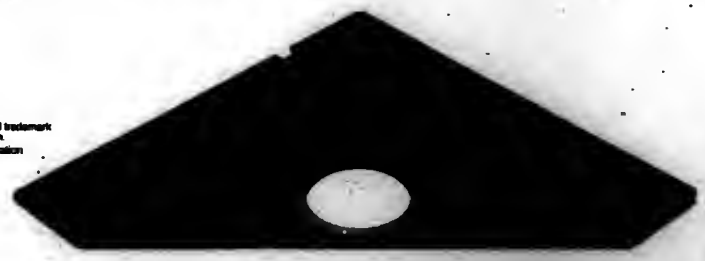

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Big Eight, software, service firms postpone truce

Congressional hearings to probe auditor independence in systems development business

CW AT ADAPSO

By Peter Bartalik
CW Staff

MIAMI — An attempt to declare a negotiated truce to the years-long dispute between the Association for Data Processing Service Organizations (Adapso) and Big Eight accounting firms was postponed recently due to the prospect of Congressional hearings.

Adapso members have carried on a bitter war during the past few years to prevent the accounting firms from offering systems development services.

At Adapso's annual meeting here last week, it was revealed that meetings between an Adapso committee and three of the Big Eight firms during the past two years were to have culminated in a motion declaring Adapso's intention not to enter into an adversary relationship with those firms.

According to the chairman of that committee, David Campbell of Computer Task Group, Inc., the motion was placed on hold because Rep. John D. Dingell (D-Mich.) directed the staff of a congressional oversight committee to conduct preliminary hearings into auditor independence.

Campbell said it is more than likely that Adapso members could end up testifying before that committee in a manner that could be considered detrimental to Big Eight firms.

Campbell said that the Adapso committee did not initiate the congressional probe, and he predicted, "I'd guess in 12 months from now, we'll be working together with Big Eight firms on such issues as certification."

There is no current prohibition to Big Eight members joining Adapso, but the firms involved in the negotiations wanted a declaration that Adapso would not turn around and continue the dispute.

> *'I'd guess in 12 months from now, [Adapso] will be working together with Big Eight firms on such issues as certification.'*
> —David Campbell, Adapso member

"They [the firms] felt it would be inappropriate to join [Adapso] and pay dues at the same time we were trying to raise funds to initiate adversarial proceedings."

He also said the committee had commissioned two studies during the past year, one to determine the attitudes of companies obtaining auditing and systems development services from Big Eight firms and the other to examine specific situations that might be considered inappropriate.

Preliminary results of the studies, Campbell said, indicate that customers are satisfied with Big Eight services and, "there was no specific situation that we felt clearly called for an aggressive, adversarial approach" by Adapso.

The committee, according to Campbell, believes the Big Eight firms are in the systems development business to stay. Additionally, he said, there would be benefits from an Adapso-Big Eight relationship such as agreement on certification issues and a grievance board to settle disputes.

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AT&T exec calls for Adapso help in lifting regulations

Claims government's regulatory provisions prohibit competition, restrict growth

CW AT ADAPSO

By Peter Bartolik
CW Staff

MIAMI — AT&T Chairman Charles Brown last week called on members of a computer industry association to help lift regulatory restraints that he said are hampering the telecommunications giant.

At a lunchtime address to the 61st Management Conference of the Association of Data Processing Service Organizations (Adapso), Brown said the remaining vestiges of government regulation of the former monopoly are keeping long-distance telephone rates high.

The Second Computer Inquiry decision rulings are redundant and causing AT&T a great deal of expense, Brown said. "I see no need for something inserted in a monopoly environment to be in existence in a nonmonopoly environment," he said.

'Rules that impede us also impede you.' — Brown

Continuing a theme he has aired in recent months, Brown said AT&T should be further deregulated to enable the intent of its consent agreement with the U.S. Department of Justice to move the company into a competitive environment.

"I'm not calling for a blank check, but government policy prevents full competition," he said. Brown reminded Adapso members of the organization's support for telecommunications deregulation and urged them to seek further government deregulation.

"It is time to do something about the regulatory remnants of divestiture," Brown said. "It is preventing us from lowering long-distance telephone rates by as much as 30% to 40%."

Brown said AT&T just recently lost a very large contract to a foreign competitor because it was forced to waste time determining what it could and could not do under current regulations.

Conceding AT&T created "some snafus" during the first nine months of divestiture, Brown said the company's massive private-line backlog is starting to turn the corner, and he expected the problems to be resolved either late this year or early next year.

Brown was particularly critical of government requirements that it stay in business areas it considers unprofitable. "You don't see any of AT&T's competition going in where they see no chance of profits. AT&T is not invulnerable," he said. Brown claimed the restraints on AT&T restrict general business growth: "Rules that impede us also impede you," he warned.

Brown also called for computer industry activity in urging the government to stimulate research and development and set foreign trade rules "in a sensible fashion."

Brown urged the computer industry executives to consider the impact of new technology on society as a whole. "We have to face up to the fact that a great many people are apprehensive about the new technology," he said.

NEWS

Computer registration checks uncover voting fraud

By Donna Roimondi
CW Staff

CHICAGO — On March 20, Irene Brewster of 6132 S. Bishop St. here did her civic duty by voting in the presidential primary in the 39th Precinct — or so it seemed.

The problem was that Brewster had moved to the South the year before, and 6132 S. Bishop St. was now an abandoned building, said Richard Andersen, executive director of Chicago's bipartisan Committee for Honest Elections. Nobody knows who did it, but someone else voted using Brewster's name, Andersen said.

Andersen, on leave of absence from the Illinois State Board of Elections to direct the committee, is using computers to help stamp out illegal votes in response to this and similar abuses, he said.

The committee purchased registered voter tapes of the 1984 presidential primary from both the Chicago Board of Elections and the Cook County Board of Elections, Andersen said. The tapes listed 1.6 million voters in Chicago and 1.2 million in suburban Cook County, Ill.

Precise Data Service, Inc. of Willowbrook, Ill., a direct mail and print shop, manipulated the list data, generated reports for precinct-by-precinct information and helped with mailings. The company fed the lists into its Magnuson Computer Systems, Inc. Model 34 computer running under Dearborn Computer Co.'s DOS/RS operating system a month and a half after the election.

The staff at Precise Data wrote software that picked 879,000 voter names based on criteria supplied by the committee, Andersen said. The committee then sent a letter to each of the 879,000 chosen registrants with instructions to postal workers not to forward the letters.

Of those letters, 90,000 came back as undeliverable, according to Andersen. Further research by the committee showed that 56,000 of these addressees were deceased or were listed as living at nonexistent addresses, vacant lots or old, burned-out buildings. The other 24,000 were returned from locations from which people had moved and left no forwarding address.

"It stands to reason that 80,000 people didn't move one and a half months after the election," said Bridget Maloney, ballot integrity coordinator for the committee. Cook County has the worst voter fraud record of anywhere in the country, she said, and the motto here is "vote early and vote often."

'Dead or not, he'll vote'

Maloney pointed out that 30% to 40% of voting lists in the southwest side of Chicago are inaccurate. "In Chicago, if someone's name is on the roll, dead or not, he'll vote," she said.

The computer matched names on the 80,000 returned letters with the voter registration list to see how many of that number had voted in the March primary, Andersen said. Of the 20,000 who voted, Andersen picked 50 random voters and upon checking their addresses, discovered that 23 were from vacant lots or houses that had been empty for five years or more, he said.

Precise Data searched the 1.6 million registered Chicago voters for same name, same birth date information, Andersen said. "Maybe 1% of this number could be unique and match, but 24,000 people on the voter rolls in Chicago registered more than once — up to seven times, in fact," he said.

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DEC, Cullinet pact gives VAX users IBM system access

Digital Equipment Corp. and Cullinet Software, Inc. have announced a joint agreement to develop products that will permit users of DEC's VAX operating system to access IBM mainframe systems through Cullinet's Information Database.

The agreement is similar to a recently announced arrangement that will give users of Data General Corp.'s CEO system an easy connection to IBM's mainframe systems via Cullinet's Information Database.

DEC and Cullinet said they will work jointly to develop applications products for "environments where IBM and DEC products coexist" and market the completed products.

DEC officials refused to say when the first application software to permit its VAX family of users to work in the IBM mainframe environment will be available.

Information Database permits users to gather and organize information retrieved from IBM mainframes into a workstation environment by providing "intelligent data communications" with the mainframe, according to Cullinet.

Leverage DEC's strengths

A DEC release said the joint agreement will leverage DEC's strengths in distributed processing with Cullinet's strengths in data access to IBM mainframes.

Al Davis, DEC Information Systems Division product manager, said the development would be devoted primarily to designing an interface of the VAX operating system into the Information Database software.

DEC is located at 146 Main St., Maynard, Mass. 01754. Cullinet is located at 400 Blue Hill Drive, Westwood, Mass. 02090.

Lax security blamed in theft of micros

By Donna Raimondi
CW Staff

BERKELEY, Calif. — Thieves who ripped off $82,000 worth of microcomputers at the University of California here had their job made easier by a lack of adequate security.

Ten IBM Personal Computer XTs with keyboards and monitors and five printers disappeared from the physics department's Birge Hall computer room one night late last month, according to Detective Greg Folster of the university's police department. The room's door lock and an additional combination lock showed no signs of forced entry, he said.

Professor Howard Shugart, vice-chairman of the physics department, discovered the loss on Sunday morning when he went in to load software on the computers, which were to be used for simulation experiments by his undergraduate physics students the next day.

The equipment, obtained through a three-year, $10 million grant from IBM, had been set up a week before the theft, Shugart said. The university's security department surveyed the setup and recommended procedures to protect the equipment, he added. Shugart ordered devices to bolt the micros to their tables, but a mix-up somewhere in the purchasing process prevented their timely delivery, he said. The room's locks were also due to be changed in a few days, he added, in compliance with the security department's recommendations.

"We lose one or two [microcomputers] every week," Folster said, which has led to the policy of bolting them to their tables. He noted that whoever perpetrated the heist had a key and knew the combination lock's code. He questioned the 20 people entitled to know the combination with no results.

No witnesses found

Although Birge Hall is in the center of the campus, and the thieves would have had to haul the computers in a van, no witnesses have surfaced, he said.

In April, the university police arrested three people in connection with 60 to 70 San Francisco Bay area burglaries of office equipment and computers, Folster said. The university recovered truckloads of stolen goods, but no computers. "They confessed to stealing some of our computers, but they sold them to their friends, and we couldn't recover them," he added.

The recently stolen computers, which were not insured, were engraved with a national police code number unique to the university, Folster said, but have no IBM serial number.

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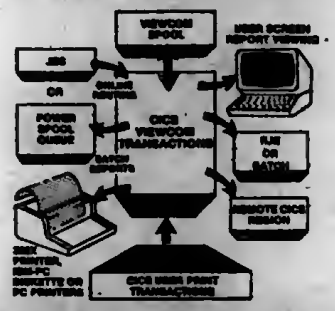

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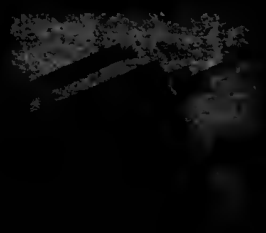

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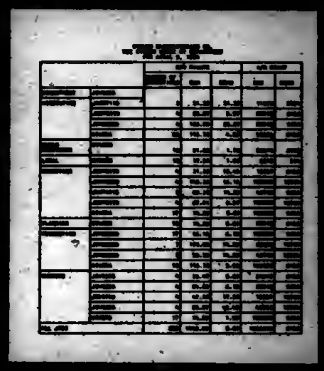

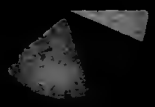

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Court hears plea for data base services' press freedom

WASHINGTON, D.C.— The credit reporting firm Dun & Bradstreet, Inc., facing $350,000 in legal damages for reporting the false bankruptcy of a Vermont building company, has appealed its arguments before the U.S. Supreme Court for the second time.

The Supreme Court, in an unusual second round of oral arguments, questioned Dun & Bradstreet's attorney, Gordon Garrett, on whether the libel case brought against the firm by Greenmoss Builders, Inc. had to prove actual damages.

Questioned by Chief Justice Warren Burger on the extent of First Amendment freedom of the press defense that Dun & Bradstreet claimed, Greenmoss attorney Thomas F. Heilman said, "Credit reports are not opinions but facts. They therefore do not need First Amendment protection." Burger replied to that statement with a question: "What facts don't deal with creditworthiness? The media don't have an incentive to libel."

Firms such as Dun & Bradstreet that market credit reports and other electronic data bases that inform users about other concerns are involved in "commercial speech," not in traditional information disseminated by a free press, Heilman countered. "[Dun & Bradstreet] does have a primary interest in the products it creates, and it accepts the consequences of what it does. It's the cost of doing business. "Credit reports assist private economic decisions, not public opinion," Heilman said.

Dun & Bradstreet's defense before the high court a second time challenged the existence of damages by an erroneous report it had published on the bankruptcy of Greenmoss. D&B said it would be willing to return to the Vermont Court of Appeals to retry the issue on the existence of damages if they occurred. The Vermont Supreme Court found that Dun & Bradstreet was an organization not entitled to the traditional freedom of speech accorded the press or a "nonmedia defendant."

The Vermont court instructed the jury that actual libel had occurred as a result of the erroneous report, Heilman said. However, no evidence had been submitted in court to prove this, Garrett said.

"Damages have to be proved; the jury can't be told that [damages] can be presumed," said Garrett in Dun & Bradstreet's defense.

The Supreme Court justices in their questions from the bench seemed perplexed at finding a distinction between a media and nonmedia defendant as far as First Amendment protections were concerned. "What's the difference between them, and what should the defense be for a nonmedia defendant?" Burger asked.

Dow Jones & Co. and the Information Industry Association have taken an interest in the case and have filed briefs supporting Dun & Bradstreet.

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Asian meeting for DEC users reslated for '85

MACAO, China — At the suggestion of the China Digital Equipment Corp. Users Society, Dexpo Asia — the first Asian exposition and conference for DEC computers and compatibles users — has been rescheduled for April 30-May 2, 1985.

The show had been scheduled for Nov. 28-30, 1984, but was postponed when officials of the delegation from the People's Republic of China said they wanted to increase their delegation from 300 to 350 DEC users.

About two dozen companies have been assigned exhibit space for the show.

Admission to the exposition is expected to be about $2, but conference fees have not been set, according to organizers.

Further information is available from Expoconsul International, Inc., 55 Princeton-Hightstown Road, Princeton Junction, N.J. 08550.

NCC '84 papers available

RESTON, Va. — The American Federation of Information Processing Societies, Inc. (Afips) has announced the "Proceedings of the 1984 National Computer Conference," which contains formal papers and illustrations presented at last summer's conference.

Session papers are divided into 10 areas. The divisions comprise the following: hardware and architecture, software, office automation, graphics, personal computers, information processing, data base management, artifical intelligence, communications and educational and social issues.

Afips members can purchase the proceedings for $40. Nonmembers must pay $80 for the report. There is a $3.50 charge for any order that is not prepaid.

For more information, Afips is located at 1899 Preston White Drive, Reston, Va. 22091.

Merger would put GM's worldwide DP in EDS' hands

DETROIT — It appears that General Motors Corp. — one of the world's largest companies — may soon become the world's biggest service bureau client if stockholders approve the auto giant's merger plans and the transfer of its data processing work load to Electronic Data Systems Corp. (EDS).

EDS, a Dallas-based computer services company, will "ultimately assume responsibility for GM's worldwide DP and communications activities," the automaker informed shareholders recently.

To facilitate that, GM intends not only to shift as many as 10,000 of its DP workers to the payroll of EDS [CW, Oct. 1], but also intends to transfer the bulk of its DP equipment and assets to its prospective subsidiary on the basis of intercompany, interest-free loans. EDS will then contract with GM to provide integrated DP and communications services at rates "consistent with those charged by EDS to its other customers."

That service arrangement will be initiated immediately following stockholder approval of GM's planned $2.55 billion buy out of EDS, an EDS spokeswoman told *Computerworld* last week. If endorsed, the merger will make EDS a wholly owned subsidiary of the world's largest auto manufacturer. It would also allow EDS to use the transferred GM workers, equipment and data processing technology to service its new and existing clients and to venture into new markets.

According to proxy materials mailed to EDS and GM stockholders, "EDS will continue to develop new lines of business, including those which will be based upon existing GM data processing technology, to be marketed by EDS to outside customers. . . . Although the assumption of GM's [DP] activities by EDS represents a substantial commitment by EDS, the availability of GM's existing data processing resources is expected to enable EDS to develop and expand both existing and new lines of business for non-GM customers."

The spokeswoman said the merger will enable EDS to enter into the manufacturing and robotics systems arenas on the basis of GM's extensive and costly research and development in those areas in the recent past. "We really do not have any manufacturing or robotics business, but we are in systems design," she said. "We can take the existing technology GM has and translate that into new ventures."

If endorsed, the merger will make EDS a wholly owned subsidiary of the world's largest auto manufacturer.

Representatives for GM and EDS declined to speculate either on the value of the GM equipment and assets to be transferred or on the contractual value of the DP services to be provided by EDS. But the companies said the assumption of GM's DP responsibilities would substantially increase EDS' volume of business and its revenues, which were nearly $800 million for its last fiscal year. While the merger proposal provides that GM common stock holders will not reap any direct benefits from EDS' ballooning revenues, the $75 billion automaker assured shareholders that the DP and communications savings involved make the merger desirable.

"I would hope that they save at least as much as they paid for us," the spokeswoman said. GM's annual DP costs have been estimated to run as high as $6 billion.

The merger proposal calls for EDS to convert GM's currently decentralized DP operations into "an integrated computer facilities network," with the aid of GM's personnel, facilities and equipment. The spokeswoman said the conversion will call for EDS to implement compatible computer systems, which will likely be linked via the EDS-Net nationwide telecommunications network, which would allow all of GM's manufacturing and dealership organizations to share information.

"It will allow all dealers and manufacturers to talk to each other in the same language," she said. "The process of ordering a car would be integrated from the very beginning, from the time someone sits down to order a car all the way to the delivery of the car."

She said the transferred GM DP and communications workers will probably be assigned to an unnamed special group within EDS. EDS currently maintains five specialized internal groups — Insurance, Finance and Industrial, Government, Health Services and International — that coordinate the company's activities in a variety of business spheres.

Asked what non-GM projects the transferred GM personnel would be responsible for, the spokeswoman said, "that would depend entirely on where the opportunities are."

A GM DP worker, who asked not to be named, told CW that the automaker's information processing personnel are apprehensive about the transfer. "It comes down to the fact that most of us aren't so much concerned about what we will be working on at EDS, but about how this move will affect each of us personally — in the wallet so to speak. A lot of us stayed with GM despite other opportunities because we thought it was a pretty stable place to work. We see now that is not the case."

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Sperry users meet slated for November

ATLANTIC CITY — A conference is being held at the Resort International Casino Hotel here Oct. 31-Nov. 2 for users of Sperry Corp.'s Sperry 1100 computer systems.

The 1100 Data Center Management Conference is designed for Sperry 1100 managers, directors and vice-presidents of MIS.

The conference will focus on data processing management issues and concerns and will give practical information for making management decisions, solving management problems and planning data center growth, according to the sponsor.

Conference topics

Topics will include: communications network management, charging for computer resources, capacity planning from a corporate viewpoint, user satisfaction, fourth-generation languages in the Sperry environment, Sperry's Mapper and its impact on programmer productivity and 10 commandments for successful DP operations.

Keynote speaker will be Earl C. Joseph, president of Anticipatory Sciences, Inc. Joseph is credited with the design of five major Sperry computer systems in his 32 years with that company, according to the sponsor.

The registration fee for the conference is $795 in advance and $850 onsite.

More information can be obtained from the sponsor, Datametrics Systems Corp., 9840 Main St., Fairfax, Va. 22031.

User services focus of Nov. 11 conference

RENO, Nev. — The Special Interest Group for University and College Computing Services (SIGUCCS) will hold its 12th User Services Conference Nov. 11-14 at the Reno Hilton here.

This year's conference, sponsored in conjunction with the Association for Computer Machinery (ACM), will address "Users Services, 1984: Ending or Beginning?"

A series of tutorials will be held Sunday Nov. 11 on topics such as data communications basics, customer service techniques, tutorials, design preparation and delivery and interviewing and selecting consultants.

Registration is $125 for ACM and SIGUCCS members who register before Oct. 14 and $135 after that date. Early registration for nonmembers is $165 and $15 for students. Registration for individual tutorials is $50 each.

More information is available from the University of Nevada System Computing Center, Computer Center Building, Reno, Nev. 89557.

Two to share $5,000 prize from SIM

CHICAGO — Two information executives will share a $5,000 prize for their first-place win in the Society for Information Management's (SIM) 1984 Paper Competition.

The two received the award for their description of a program they developed to speed the definition of a management information system project, said the chairwoman of the SIM awards committee, E. Nancy Markle.

The winners, announced at a SIM conference here recently, are John Batiste, an information systems consultant with A. O. Smith Harvestore Products, Inc. in Brown Deer, Wis., and John T. Jung, director of management information systems at Chubb & Sons Insurance, Warren, N.J.

Second place in the competition, which included a $2,000 prize, was shared by three entrants: Michael Shank, Andrew C. Boynton and Robert W. Zmud. Shank is executive vice-president of Financial Institutions Assurance Corp. in Raleigh, N.C., and Boynton and Zmud are both from the University of North Carolina School of Business, Chapel Hill, N.C.

The Batiste and Jung paper, titled "A Structured Approach for Determining MIS Project Definition," explained how the two have "taken an approach to defining systems and shrunk it from months to weeks," Markle noted. Project definition, she explained, is the period during which the business function to be automated is laid out in step-by-step fashion.

Third place in the competition, which included a $1,000 prize, went to Omar A. El Sawy, an assistant professor in the school of business administration of the University of Southern California.

Markle said papers are now being accepted for SIM's 1985 competition. Papers must describe a management information system, an approach to developing information systems, a technique for improving MIS activity or the management of the MIS activity. Papers may be sent to SIM, Suite 690, 111 East Wacker Drive, Chicago, Ill. 60601.

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Office politics blocks OA implementation

By Edward Warner
CW Staff

CHICAGO — With nearly every corporate department claiming authority over a key portion of the office automation (OA) plan, business consultant N. Dean Meyer said he believes the biggest roadblock to OA implementation is office politics.

Meyer, president of N. Dean Meyer and Associates, Inc. of Ridgefield, Conn., told a gathering of information managers at a recent conference of the Society for Information Management here that "no matter what we give to [those implementing OA], we're stepping on somebody's toes."

He claimed that "these unhealthy relationships are designed into an organization," but that it is the MIS executive's responsibility to bridge the relationships when introducing OA.

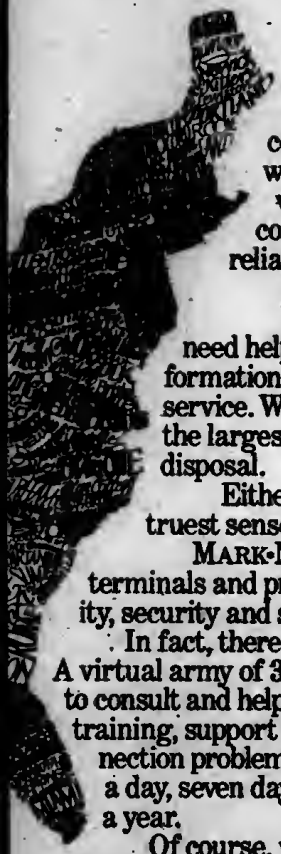
The MIS manager's best tool for this task, Meyer said, is the use of a team of in-house business consultants who can choose portions of the services of each MIS department — micros from the information center, access to outside data bases from the corporate library — as they put together an OA mix that is right for the situation.

The internal OA consultant should be business-oriented rather than a technician and should be able to draw on an understanding of all business functions, from engineering to finance, Meyer explained. Because of this, he added, they are better recruited from the ranks of the users than from the ranks of the MIS or DP departments. In addition, he said, "It's a lot easier to take business people and train them in systems," than to do the reverse.

Users need such consultants, Meyer said, because the users would otherwise get a one-sided view of OA if they were to approach individually each of the departments that will add to the OA plan.

People in such departments, he noted, will "by the nature of their jobs put technical excellence ahead of solving the business's problems."

es than anybody.



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Generation counting useless in research: IBM exec

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — It is time to stop counting computer generations and to abandon the term "fifth generation." That was the message Lewis M. Branscomb, vice-president and chief scientist at IBM, delivered to an audience at the annual conference of the Association for Computing Machinery, held here recently.

"Whatever value this phrase has had in stimulating attention to the ultimate commercial promise of computer science ideas, which are generally referred to as artificial intelligence, I think it has outlived its usefulness," Branscomb said.

Instead, computer scientists should talk about the various components that make up advanced research in computer science, including symbolic processing, expert systems, image and speech processing, robotics, parallel processing, high-speed scientific computing and advanced data base structures, he said.

Adopt official terminology

Although the term fifth generation generally refers to the set of advanced computer science research projects now underway in Japan's Institute for New Generation Computer Technology, even the Japanese do not use the term, Branscomb said. Their project is officially named "Research for Basic Computer Technology," he noted. American computer scientists should adopt the official Japanese terminology, he said.

But the U.S. should not copy the Japanese model for stimulating research activities in computer technology, which "places great emphasis on far-reaching goals as a means of concerting action and building consensus," Branscomb said. Each nation must choose its own path, based on its own culture and traditions, he added.

"Our tradition is to foster the richest possible variety of possibilities for the evolution of each person's plans into private goals," he said. "We put special reliance on our universities to be fertile ground for a great variety of visions. We rely on new venture formation and on corporate fundamental research to translate those visions into reality," he added.

Political interests in foreign trade balances, international competition and technology policies should not control fundamental science, he said.

"Science thrives on the unobstructed flow of ideas," he said. "It knows no nationality, has no company logos, follows no ideology. No scientist's joy in an exciting new idea is diminished because of the nationality of its author."

Research in AI, for instance, has been pursued in many universities in many countries, Branscomb pointed out.

Science is international, and so are many of the companies in the information industry which employ scientists from many countries, he said. Siemens Corp., for instance, has a laboratory in Princeton, N.J., where American scientists work on knowledge-based systems, he said.

This work, which transcends nations and nationalities, benefits everyone by adding to the body of world scientific literature, Branscomb said. "Let us cooperate among scientists, compete among companies and respect the duty of sovereign governments to create the environment in which science flourishes and trade is free and fair," Branscomb said.

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NEWS

Financial industry fertile ground for expert systems

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — As a result of deregulation and intensifying competition, the financial services industry is ripe for the installation of expert systems — computer programs that perform a specialized professional task at the level of a human expert.

That was the assessment of Sandra Cook, manager of financial expert systems at SRI International, Inc., a Menlo Park, Calif.-based research institute. Cook spoke before a seminar audience at the annual meeting of the Association for Computing Machinery held here recently.

An expert system includes a knowledge base of facts, assumptions and beliefs, as well as methods of reaching a diagnosis, interpretation or solution to a problem; a knowledge base management system, which organizes, controls and updates the stored knowledge and initiates searches; and an inference engine, which works with the information in the knowledge base.

According to Cook, several financial expert systems are now under development, but none have been completely fielded to date. SRI International, for instance, is designing a prototype system that will handle letters of credit and document processing, she said.

In order to decide whether a particular application is appropriate for the development of an expert system, Cook suggested that the problem must meet a number of criteria, including the following:

- No algorithmic solutions exist that can handle the problem.
- A poor decision will have a significant impact in terms of financial cost, resource consumption, time delay or risk.
- It is likely that a nonexpert will make a poor decision. The machine's expertise must be significantly higher than a nonexpert's, she noted.
- The problem to be addressed must be relatively static compared with the time it takes to analyze the problem. For example, an expert system will not meet the needs of a nuclear plant operator, who is faced with a meltdown in three minutes, if a system takes 18 minutes to pinpoint the problem, Cook said.
- The problem to be addressed can be solved by an expert. Expert systems, Cook noted, "only know what's been programmed in," and cannot generate expertise on their own. The development of a system requires the willing participation of an expert who is "virtually taken hostage while the system is under development," Cook noted.
- The knowledge domain must also be relatively static. If it is subject to rapid change, professionals should think twice about developing an expert system for the application, Cook warned.
- Finally, an application requires a political climate that is friendly to the new technology.

According to Cook, the back office is the most appropriate place to begin in the financial services industry. An expert system can be used to automate a number of services, from processing letters of credit, to receiving and paying account reconciliations, to replacing the current procedures for credit

See EXPERT page 31

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Long-term research key to quest for next generation

By Kathleen Sullivan
CW West Coast Bureau

SAN FRANCISCO — If computer scientists hope to realize their dreams of designing fifth-generation computers — machines that incorporate artificial intelligence and allow computers to understand natural language, make deductions, draw inferences and solve problems — they must get off their "moon shot mentality" and focus on long-term research.

Speaking at the annual gathering of the Association for Computing Machinery (ACM) held here recently, Michael Dertouzos, director of the Laboratory for Computer Science at MIT, urged his audience to adopt a long-term orientation in the quest for the next generation of computers.

"We must get off the moon shot mentality," Dertouzos said. "The moon shot dealt with a mature technology and every step was known. The only objective was to do it well. But here, [in AI] we're still exploring. We must stop and turn over stones — look them over, evaluate and choose."

Term refers to Japanese efforts

For its three-day conference, the ACM had chosen "The Fifth-Generation Challenge" as its theme. Dertouzos explained that for many people, the term "fifth generation" referred to the efforts of the Japanese to design the next generation of computers.

Three years ago, the Japanese announced the beginning of a 10-year research program, a joint effort by government and industry, to explore new computer technology.

"To me, however, fifth generation means long-term research, 10 to 15 years out," Dertouzos explained.

C. Gordon Bell, chief technical officer for Encore Computer Corp., echoed Dertouzos' remarks. Typically, Bell said, a significant invention in the computer industry is not translated into something useful until 10 years after its introduction.

'Evolutionary, not revolutionary'

"The whole process is evolutionary, not revolutionary," he added. However, he warned that today's scientists and engineers are not heeding this historical lesson. "We're not following the evolutionary approach. We're trying to go ahead and build new computer structures." Only a small number of these projects are worthwhile, he said.

According to Bell, research efforts in the U.S. are lagging behind. "We're not doing what we need to do to get to fifth-generation computers," he noted.

Lewis M. Branscomb, IBM's chief scientist, had another warning for the ACM gathering. Although he noted that research in AI has yielded "impressive progress" so far, he said patience and determination would be required to achieve further gains. But, he cautioned, computer scientists should paint a more realistic picture of the work ahead.

"The extravagant statements of the past few years have become a source of concern to many of us who have seen excessive claims by researchers in other fields lead to unreasonable expectations by the public," Branscomb said. He noted that this could lead the government leaders who control support for these projects to become disenchanted.

> *'Here, [in aritficial intelligence] we're still exploring. We must stop and turn over stones — look them over, evaluate and choose.'*
> — Michael Dertouzos, director of the Laboratory of Computer Science at MIT

Edward A. Feigenbaum, a professor of computer science at Stanford University and coauthor of the book *The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World*, said that previous work in computer design could be divided into two eras. The first era — the last 35 years — has been defined by computers that performed calculations and managed data processing.

According to Feigenbaum, the industry is now in a state of transition into the next era, which will encompass symbolic processing. "There's a vast open area of computing to be filled in the second era," he observed.

The Japanese have targeted fifth-generation technology because they understand the economic potential of new technology in information processing, Feigenbaum explained.

He cited a recent Arthur D. Little, Inc. study, which predicted that the market for AI, including hardware, software and services, would reach $5 billion to $10 billion by 1990. Within five years, this market will grow to between $30 billion and $70 billion. By the year 2000, it will reach the $50 billion to $110 billion range and make up about 20% of the total computer industry market, according to the study.

Japanese hotel boasts 45-second automated check-in

Computerized front desk processes reservations, issues key cards, handles payments

By Susan Blakeney
CW Staff

TOKYO — A hotel with a 45-second check-in time?

If that sounds too good to be true, weary travelers are advised to check out the 25-story high-technology Shinjuku Washington Hotel, which opened for business here last December. The hotel introduced an automatic front desk system that processes reservations and payments, issues magnetic guest cards and dispenses receipts as well.

The automated machines were made by Omron Tateisi Electronics Co., Japan's largest manufacturer of automated teller machines. The system, whose technology permeates all hotel operations, was four years in the making, said Katsao Kojima, a hotel spokesman.

A lobby of computer terminals

Upon arrival, Kojima said, the guest is greeted by a lobby of computer terminals. The menu-driven system initially displays a woman bowing in welcome. The guest enters his reservation number or personal information if no reservation had been made. The guest then pays for his accommodations in advance ($30 per night per single room) plus a refundable deposit to cover extras such as pay movies or drinks. The machine assigns the guest a room and issues a magnetic card.

In addition to serving as the guest's key, the card activates the lighting, television and air conditioning in the room when inserted into a console in the guest's room, Kojima added.

When checking out, the guest inserts the card into a terminal in the lobby and a final room tab is calculated. If the guest's deposit exceeds the final bill, the machine processes a refund. If the guest owes additional money, the machine accepts either cash or credit cards.

The system automatically changes the door codes after each check-out so the old cards cannot reopen them. The machines can read the denominations of bills inserted and is even capable of making change, Kojima said.

The hotel, which has a capacity for more than 2,000 people, is staffed by 130. While nonautomatic check-in is available to handle any special problems, Kojima estimated that more than 60% of its guests utilize the Shinjuku's automatic system.

"It's like . . . a giant video arcade," Kojima said.

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EXPERT from page 29

scoring on consumer loans.

Those companies that are considering the installation of an expert system should choose their first application with care, Cook said. She suggested that the initial application should be developed in conjunction with a vendor to increase the chances of a successful system.

The financial services arena provides a favorable environment for expert systems because of the nature of the industry, Cook said. In general, there is a shortage of experienced personnel available for making sound business judgments, she said. Yet, the quality of decision making in the financial services market has a "direct impact on the bottom line." An expert system can help leverage scarce financial and technical expertise, Cook said.

An expert system can constitute a "secret weapon" in a bank's arsenal of corporate competitive strategies as it faces off against new rivals in the financial services arena, because the systems can help cut costs. "And cost reduction is crucial to their corporate survival," Cook said.

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OPINION

Japan embraces trend toward self-contained systems

By Lee Sala
Special to CW3

TOKYO — Datashow Japan once again made clear that microcomputers and office automation systems in Japan follow a different course from the rest of the world. Japan's development efforts lean more toward complete systems, which are as yet unsuitable for the U.S. and European markets.

This does not mean that the Japanese export of micros is nonthreatening, because Japan does have the production capacity and cost structure to make lower priced products for these markets. But it does imply that Japan will not compete on the leading edge of technology and is limited to more standard and well-accepted products.

Japan has departed from the mainstream of IBM-, AT&T Unix-, Microsoft Corp. MS-DOS-type products that emphasize integrated software. Each year, we expect Japanese manufacturers to move toward our Western uniformity, but a visit to the Harumi exposition center here for the annual Datashow proved that it will take more than IBM to change the nature of Japanese computing.

The trend in Japanese microcomputers is toward functional integration of hardware (as opposed to software). Systems are being built together to include printers, monitors and disk drives — preferably all in a single housing. Everyone must have his own peripherals in Japan, unlike in the Western world.

At Datashow, a number of personal-computer-aided design systems were on display, as well as noiseless thermal typewriters, word processing firmware and scads of small portable (even miniaturized) systems.

Sala is the editor of a Netherlands-based micro newsletter and a frequent contributor to Computerworld.

Four charged with computer services fraud

MONTREAL — Four Montreal-area men who allegedly made $20,000 worth of long-distance telephone calls with the help of a "blue box" microcomputer program have been charged with theft of services in Canada's first such case involving a computer.

"They were charged under a law that normally holds for blue-boxing, but, at least from what the police tell us, they are the first in Canada to have used a computer to defraud us," said a spokesman for Bell Canada Telephone Co. A blue box is a device used to generate the 2,600Hz tones utilized in Bell Canada and AT&T networks, according to the spokesman.

The spokesman said the fraud was uncovered when Bell Canada's computerized tracking system showed disproportionate numbers of long-distance calls coming from the young men's homes. Those calls were made toll-free after the men allegedly modified the software in their modems to dial toll-free numbers automatically and take control of the switch. "Once they had that control, they could reroute the call to any place in the world," the spokesman said.

The hackers reportedly made most of their calls to computer bulletin boards throughout the U.S. and made apparently unsuccessful attempts to access academic and corporate data bases.

The four, college students aged 18 to 20, were arrested earlier this month when police, accompanied by Bell Canada computer experts, raided their homes. The raiders seized several Apple Computer, Inc. Apple IIe personal computers and Novation, Inc. Apple-Cat modems that allegedly were modified to generate the 2,600Hz tones.

The Bell Canada spokesman said technicians are now working to establish court-admissable proof that the modified modems were keys to the fraud.

The men, who reportedly did not know each other except by aliases, allegedly each possessed 300 to 500 floppy diskettes with programs ranging from games to instructions for building napalm grenades.

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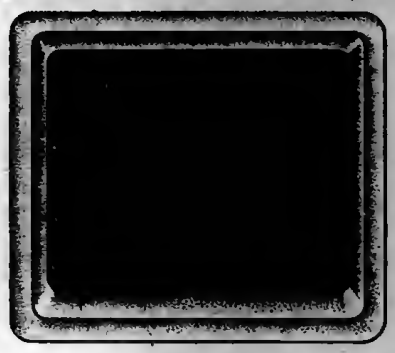

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NEWS

INTERNATIONAL REPORT
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AUSTRALIA

SYDNEY — Sources here say that Digital Equipment Corp.'s long-awaited announcement of Venus will happen soon. The Venus system will offer the capacity to handle 4 million instructions per second and four times the power of the vendor's VAX-11/780, according to a spokesman. It will reportedly compete against the IBM 3083/E system and provide about twice the processing power of the Data General Corp. top-of-the-line MV/1000. The new DEC system has already been ordered by the Australian Broadcasting Commission and is expected to cost approximately $625,000.

■

MELBOURNE — If the pilot study goes well, some 100 IBM Personal Computers, valued at $500,000, will be connected on-line to an IBM System/38 at the Grain Elevator Board here. The Grain Board is currently conducting a feasibility study that will focus on how an IBM Personal Computer situated in a remote weigh station and connected to a centrally located System/38 can be used to record information about the board's grain shipments.

CANADA

OTTAWA — "Building a new Canada" was the theme of the Conservative election campaign that resulted in the election of Prime Minister Brian Mulroney. Technology development in Canada is going to be a much higher priority than it was during the Pierre Trudeau years, according to Mulroney, who hopes to boost R&D funding from a current level of 1.3% of Canada's gross national product to as much as 4%.

CHINA

BEIJING — Sperry Corp. has signed an agreement in principle to manufacture a new computer system based on its Mapper fourth-generation software here. The pact was collectively penned with the China International Trust and Investment Corp., China Computer Technical Service Corp. and the Wuxi Computer Factory, according to a Sperry spokesman.

HONG KONG

HONG KONG — A top IBM official warned against software piracy here during the recent Southeast Asia Regional Computer Conference. "Southeast Asia is the fastest growing market in the world," said George Conrades, IBM's Asia/Pacific vice-president, "[but] we must ensure an environment where innovation, creativity and investment are protected and encouraged." Conrades emphasized the importance of copyright, while cautioning against restrictions on open international trade.

JAPAN

TOKYO — In the wake of several automatic translation system announcements, Hitachi Ltd. has announced the development of a Japanese-to-English translation system called Athene/E. The system can reportedly translate scientific and technical documents at a rate of 60,000 words per hour.

■

TOKYO — Announcements of optical magnetic disk systems were made here recently by two major vendors — Hitachi Ltd. and Sony Corp. The Hitachi optical magnetic disk can reportedly load 560M bytes of data on a disk that measures 12cm and reads data at 0.1 sec. The Sony product is a loadable, large memory optical magnetic disk system with a memory capacity of 1G byte. It can reportedly load the equivalent of 1,000 floppy disks, and reading time is 0.1 sec.

SWEDEN

STOCKHOLM — Ericsson Information Systems, Inc. has become the latest large vendor to try its luck in the personal computer marketplace. The company unveiled the IBM Personal Computer-compatible Ericsson Personal Computer, based on the Intel Corp. 8088 microprocessor, which features extensive communications facilities and promises to cost 10% less than the IBM Personal Computer.

ENGLAND

LONDON — The British government is reportedly preparing to discontinue financial support for domestically produced software under its Software Products Scheme (SPS). Software companies around the country are up in arms over the news and vow to "fight to see it retained." SPS was initiated in 1972 and has allocated over $45 million in grants to subsidize indigenous software development and marketing efforts.

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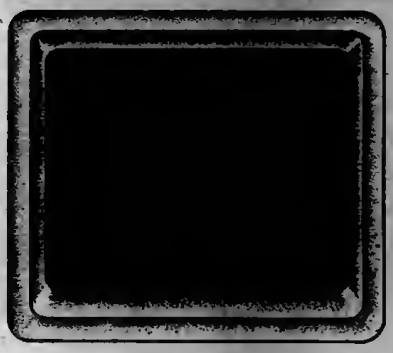

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30 Medicine/Law/Education
40 Wholesale/Retail Trade
50 Business Service (except DP)
60 Government—State/Federal/Local
70 Public Utility/Communication Systems/Transportation
75 Mining/Construction/Petroleum/Refining
75 Other User _____

Vendors

80 Manufacturer of Computers, Computer related Systems or Peripherals
90 Computer Service Bureau/Software/Planning/Consulting
85 Computer/Peripheral Dealer/Distributor/Retailer
85 Other Vendor _____

2. OCCUPATION/FUNCTION (Circle One)

11 President/Owner/Partner/General Manager
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12 Treasurer/Controller/Financial Officer
21 Director/Manager/Supervisor DP/MIS Services
22 Director/Manager of-Operations/Planning/Administrative Services
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
35 OA/WP Director/Manager/Supervisor
38 Data Comm Network/Systems Mgmt
41 Engr/Scientific/R&D/Tech Mgmt
51 Mktg Sales Reps/Sales/Marketing Mgmt
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80 Educator/Journalist/Librarian/Student
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3. COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment with which you are personally involved either as user, vendor or consultant

A. Mainframes/Supermins
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C. Microcomputers/Desktops
D. Communications Systems
E. Office Automation Systems

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NEWS

CALENDAR

WEEK OF OCT. 28

OCTOBER 29-30, SAN FRANCISCO — **Future Trends & Opportunities: The Next Five Years in Telecommunications & Microcomputers.** Contact: Creative Strategies International, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

OCTOBER 29-31, BOSTON — **Data Analysis.** Contact: QED Information Sciences, Inc., QED Plaza, P.O. Box 181, Wellesley, Mass. 02181.

OCTOBER 29-31, NEW YORK — **Microcomputer Data Base Management Systems.** Contact: Software Institute of America, 8 Windsor St., Andover, Mass. 01810.

OCTOBER 29-31, WASHINGTON, D.C. — **Strategic Planning for Telecommunications.** Contact: Technology Transfer Institute, 741 10th St., Santa Monica, Calif. 90402.

OCTOBER 29-31, WASHINGTON, D.C. — **Testing Computer Software: Producing Defect-Free Systems at Minimal Cost.** Contact: U.S. Professional Development Institute, Testing Computer Software, 1620 Elton Road, Silver Spring, Md. 20903.

OCTOBER 29-31, LOS ANGELES — **Financial Information Systems: Integrating Personal Computers.** Contact: National Institute for Management Research, P.O. Box 3727, Santa Monica, Calif. 90403.

OCTOBER 29-NOVEMBER 2, NEW YORK — **CICS Macro-Level Programming.** Contact: Sysed, Inc., 35 W. 35th St., New York, N.Y. 10001.

OCTOBER 29-NOVEMBER 2, ORLANDO, FLA. — **IDMS-DC Programming Workshop.** Contact: Steve Harris, Harris Education Center, Suite 507, 6220 S. Orange Blossom Trail, Orlando, Fla. 32809.

OCTOBER 29-NOVEMBER 2, WASHINGTON, D.C. — **Comparative Data Base Management Systems.** Contact: Chip Blouin, George Washington University, Washington, D.C. 20052.

OCTOBER 29-NOVEMBER 2, WASHINGTON, D.C. — **Microcomputer Application Workshop: Evaluating Microcomputer Software Packages.** Contact: Chip Blouin, George Washington University, Washington, D.C. 20052.

OCTOBER 30-31, DALLAS — **Competitive Edge Sales Seminar.** Contact: Teleconnect Magazine, 12 W. 21 St., New York, N.Y. 10010.

OCTOBER 30-NOVEMBER 1, SAN FRANCISCO — **Integrated PBXs and Desktop Terminals.** Contact: John A. Gutman, Probe Research, Inc., P.O. Box 590, Morristown, N.J.

OCTOBER 30-NOVEMBER 2, SYDNEY, AUSTRALIA — **Seventh International Conference on Computer Communication.** Contact: Seventh International Conference on Computer Communication, 50-52C278, P.O. Box 3509, New Brunswick, N.J. 08903.

OCTOBER 30-NOVEMBER 2, NEW ORLEANS — **The 17th Annual Microprogramming Workshop.** Contact: Institute of Electrical and Electronics Engineers Computer Society, P.O. Box 639, Silver Spring, Md. 20901.

OCTOBER 31, SANTA CLARA, CALIF. — **Conflict Management: A Workshop for Engineers and Technical Professionals.** Contact: Georgyne Purcell, American Electronics Association, P.O. Box 10045, Palo Alto, Calif. 94303.

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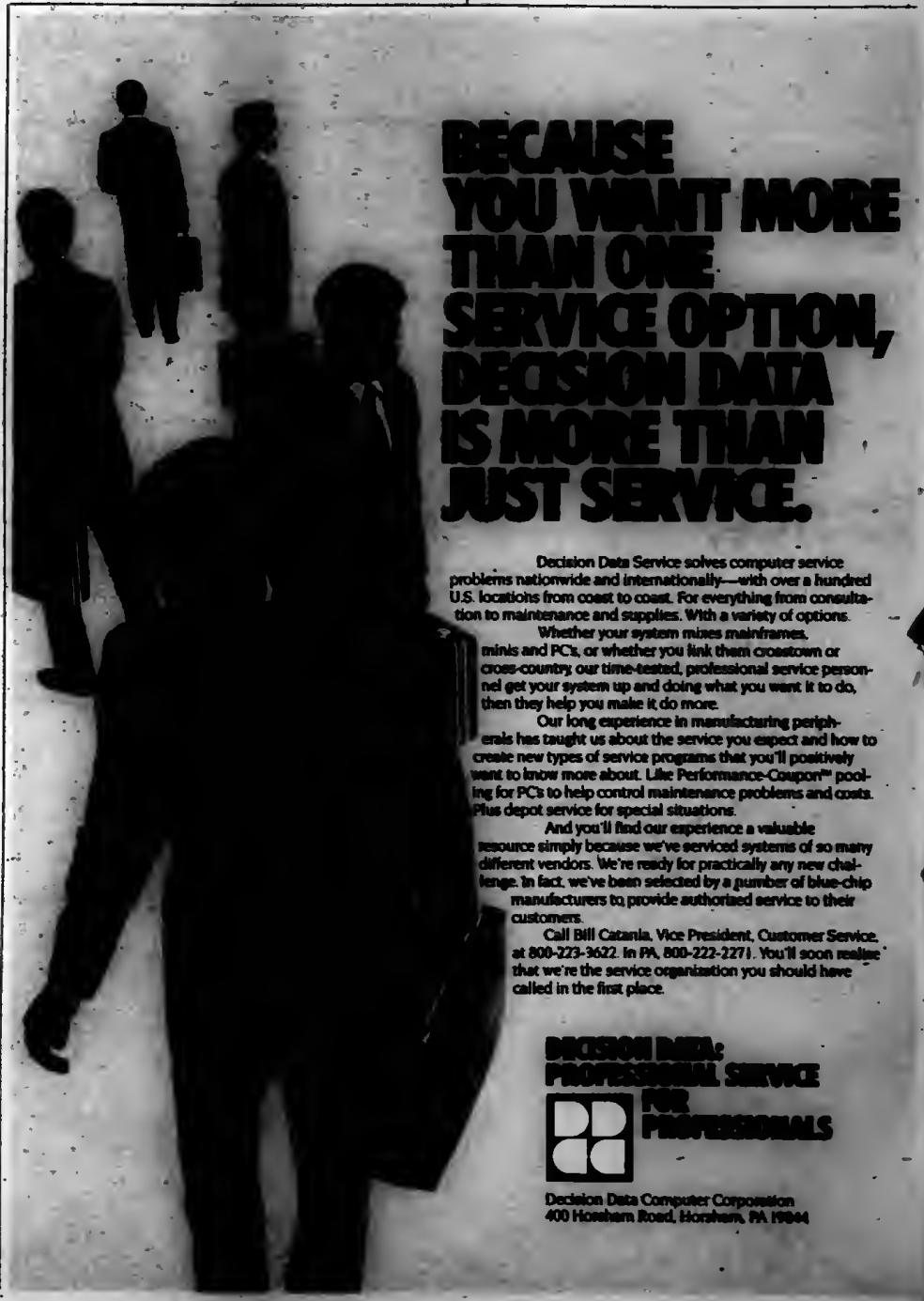

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Hundreds of employees can take a course at the same time, and it is easy to train a large audience quickly.

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By Gary Livingston

After training . . .

Management cannot afford downtime at functional levels when micros become integral to the workplace.

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By Steven Hochberg

Three systems

If off-the-shelf courses meet your requirements, they are much more cost-effective than authoring your own.

Page 46

By Marsha Seidman

Perfect for micros

Imagine a project involving hundreds of thousands of dollars in hardware and software and hundreds of people who are barely computer-literate from dozens of educational and sociological backgrounds. Consider the limited resources that are available to train these individuals and the pressure of project deadlines.

These are the typical personal computer implementation training problems most organizations face today. The traditional classroom or one-on-one training approach, while still the most preferred, is impossible in this environment.

Because of the high costs of instructors and limitations on students' time, organizations are increasingly turning to computer-based training (CBT) to meet their personal computer training requirements.

With CBT installed on the personal computer, students receive one-on-one instruction. They go through the material at their own pace. The computer routes students through various instructional sessions, simulates actual applications, provides drill and practice and tests the student for mastery.

Instruction is available to students at almost any time. They are freed from taking a few days off from work to attend classes. Students can spend as much or as little time each day as necessary to cover the material. Since hundreds of students can take a course at the same time, it is easy to train a large audience in a short period.

For example, classroom instruction on a given topic might take five days to teach, and the class size might be limited to 20 people. If you have one instructor and 600 people to train, it will take 30 weeks or more than seven months to train everyone. With CBT, the course can easily be distributed and everyone trained within one month.

All students receive the same basic information and are mastery-tested to make sure they know the material at a specified competency level. With some CBT systems, student records and test data can be reported on and analyzed.

There are three basic types of CBT delivery methods for the personal computer. The easiest is the purchase of off-the-shelf CBT courseware. The personal computer's operating system is all that is needed to run this courseware.

This courseware is the least expensive option, and it is ready to use. Because of the nature of the courseware code, alteration or customization of the courseware is impractical or impossible. The courseware does not include student record keeping and tracking mechanisms. Students are simply given their test scores upon completion.

The second major CBT delivery method entails the purchase of off-the-shelf courseware that runs on a presentation system. The necessary components are the CBT courseware, a presentation system and the operating system.

Courseware that requires a separate presentation system is generally presentation system (and authoring system) specific. This means that if a course is developed in XYZ language it will run only using the XYZ presentation system. A different presentation system will not run XYZ courseware, nor will non-XYZ courseware run on XYZ's presentation system.

The presentation system adds extra costs to the CBT delivery method, but there are definite advantages. Most presentation systems offer optional authoring systems that facilitate courseware tailoring.

Computer-managed instruction

In addition to the potential customization capabilities, presentation systems offer various degrees of record keeping and testing facilities. This facility generally goes under the term "computer-managed instruction."

Computer-managed instruction is often the most unrecognized yet most vital part of CBT. The importance of monitoring student progress, checking on mastery fulfillment, examining courseware testing effectiveness and evaluating course content make computer-managed instruction a valuable resource.

The third major CBT development and delivery method is the combination of a CBT authoring language, a presentation system and the personal computer's operating system. With the added dimension of an authoring system, courseware can be developed from scratch, or off-the-shelf courseware can be modified.

Authoring opens up a new dimension in CBT. It means that courses can be constructed to meet specific training requirements. One should not hesitate to get into courseware authoring, but developing good courseware takes careful planning and skill.

Authoring languages

Authoring languages available today run the gamut from complex programming languages to easy-to-use, menu-driven systems. One should carefully consider selecting an easy-to-use authoring language, since one of the most expensive aspects of developing courseware is the authoring time requirement.

Before starting to author courseware, courseware development time and the overhead costs involved should be estimated and compared with the costs involved in using a traditional training methodology.

CBT training is now becoming the predominant training mode in the

personal computer area. However, CBT is not always a cure-all. It is a necessary training tool, but it must be of good quality, cost justifiable and supported through other activities.

Quality considerations

Quality is one of the key elements to consider when using CBT to train individuals on personal computer use. Not all CBT courses are of equal quality. In the early days, the courses developed were basically page turners.

During its infancy, CBT was basically the automation of text books and test questions. The student read the text shown on the screen, progressed through the material by reading screen after screen and then was tested. This process made for boring instruction.

As CBT progressed, courses began to include simulations that actually showed applications and concrete, real-life examples. The student was drilled and became active in the learning process. The use of advanced graphics and illustrations are further enhancing today's CBT courses.

Care must be taken when purchasing CBT courses or creating them. Students must not only receive instruction that enables them to perform a given set of tasks, but the instruction must be exciting and appealing. Creating interest in the instruction is especially critical when personal computers are being implemented with audiences that are skeptical of the technology. If these students do not find the instruction exciting and practical, they not only will reject the CBT course, they will reject the personal computer as well.

Know target audience

All CBT courses should be piloted with a test group from the targeted audience prior to the full release of the course to others. The difference in audiences has a lot to do with CBT's effectiveness and acceptance.

A CBT course might work very well with managers but not be effective with professionals in another area. The key is to know your target audience. Do not assume all groups and levels within the organization have equal levels of education and common interests. It is also important to consider the level of acceptance or resistance the audience has toward the personal computer and its use.

Tailoring the course to your own requirements can help you meet specific needs within target audiences when an off-the-shelf course is too generic. This tailoring is achieved by developing additional CBT modules or by actually changing the course itself.

Changing the course is not possible in some situations because of the nature of the CBT software. In addition, courses that are altered are usually not under manufacturer's warranty once they have been altered. It is best to check with the manufacturer before altering any course.

Quality CBT courses are important. These steps will help ensure quality:

- Know the specific training requirements of your target audience.
- Have trained CBT personnel examine the course prior to piloting the courseware and review it with them.
- Understand your audience's level of resistance or acceptance to the personal computer.
- Pilot test the course with a group from the target audience.
- Accept, reject or modify the course to meet the requirements of the particular audience.

CBT courses that teach almost any personal computer topic are now available. Hundreds of courses are advertised. Software manufacturers have even begun to bundle CBT courses with their products. The personal computer user not only gets the software but is given the training with the package.

Providing quality training to the personal computer software user has become a priority for software manufacturers. Those software companies that will be successful are those that are best able to deliver training on their product with a minimal amount of student time required.

Purchasing personal computer software for $400 or $500 is of little concern when the cost in student time to learn how to operate the software might be $1,200 to $2,400 per person. If a CBT course comes with the software, obviously this reduces the need to purchase other CBT courses or support materials.

However, do not assume that the courseware you receive with the software is high quality, meets audience needs or has adequate depth of coverage on the topic. Most CBT courses that come with personal computer software are comprehensive in nature but do not provide in-depth information on specific topics.

Generally, courses that can be purchased off the shelf have similar characteristics to their bundled counterparts. The costs for these off-the-shelf courses usually run from $40 to $100.

Some courses cost as much as $400. Price is no guarantee of quality, and many of the inexpensive CBT courses are the best value.

Dollar for dollar, CBT for the personal computer is a great value. It generally costs three to four times as much as the average text book, yet it provides the student with individualized interactive instruction. In areas where the student requires special attention, CBT can drill the student on the topic until the material is mastered.

Studies have shown that CBT generally reduces student learning time when compared with text books or live instructional methods. The savings in learning time can be reduced by 10% to 40%. This translates into a considerable dollar savings and often more than offsets the additional upfront CBT costs.

Copy license

One thing to remember is that each course you purchase is copyrighted and often protected. If you have a large audience to reach you will need to purchase multiple copies of the course. This increases the cost of training and can cause minor logistical problems if you are supporting remote sites. If you require many copies of a specific course, go directly to the manufacturer, not the distributor, and request a special multiple copy license.

If you decide to author your own CBT courseware, be sure to consider all the overhead costs involved. The costs of the authoring system, presentation system and courseware authoring time should all be taken into account.

Usually, CBT is most cost-effective when the audience requiring training is large, and you need to train people at remote sites. Don't fall into the trap of discounting CBT because it sometimes costs a bit more than other training methodologies. In some instances, a guarantee of student mastery and consistency in training outweighs the additional training costs.

Need for support

One of the biggest mistakes made in using CBT is placing the sole responsibility for teaching the material to the student on CBT without any outside support. Typically, an organization acquires hardware and software for its staff. Next, CBT courses are obtained, distributed to students and then students are left to fend for themselves.

This approach makes for underutilized technology. It leads to unnecessary user frustration and can even result in the rejection of the technology. To really use CBT effectively requires user-area support staff who can provide assistance or answer student questions.

Help desks, hot lines and knowledgeable staff in remote sites are critical. CBT will cover the major job of teaching the material, but students always have some questions. These questions must be answered correctly and in a timely manner by support-team members.

Another problem with this approach is that in cases where CBT courses lack computer-managed instruction record-keeping capabilities, students often simply skim through the material or fail to complete the course. Since there is no record keeping on student progress or completion, students can easily avoid completing the training.

Employees are usually not at fault. Managers and supervisors are generally guilty of not letting the staff complete the course or even get started.

Computer-managed instruction provides a basis for the development of an accountability system for ensuring the students complete the course within a specific time frame and achieve mastery level.

It does little good to have hundreds of people using CBT courses who will never complete the material. If the student's use of technology is cost-justifiable and important to the organization's productivity, then it is essential that there be some guarantee that the training is completed.

Cure for anarchy

Making employees and management accountable at their performance review for training is the cure for training anarchy. Only when training is viewed as important enough to be measured and evaluated will it become important.

On-the-job skills reinforcement is another area where CBT requires support. If CBT is used to train a person on personal computer usage and the employee returns to a work area where the use of the technology is not encouraged or reinforced, he soon loses that skill.

Workers must not only be permitted to acquire specific skills, they must be placed in an environment that supports the use of these newly acquired skills.

Simply passing out personal computers and providing quality training is not enough. Positive encouragement and reinforcement is required. Students must not only be familar with personal computers and their applications, they must be given opportunities to use these skills.

The use of CBT in training personnel in the use of personal computers is essential. The key is not whether CBT is going to be used but how it is going to be managed. It is not a quick fix. Those who have sought to use it this way have found their careers shipwrecked.

The winners are those who have carefully considered the costs, evaluated their needs and made a commitment to make their CBT training count.

About the author

Gary Livingston is president of Livingston & Associates, a consulting firm located in Cleveland, Ohio. The company specializes in consulting on CBT, the information center, data processing training and technical writing.

"Before I put one more computer on the shop floor, I want one powerful system that puts it all together reliably: inventory control, shop scheduling . . . even shipping!"

"This company's marketing decisions are too big for one little spreadsheet. I need total decision support if I'm going to meet my revenue goals. And I need it now. Or after lunch, at the latest."

After training

End-user microcomputer support is becoming a major issue for corporate managers. For both the microcomputer coordinator whose responsibilities include acquisition, implementation and training and the corporate manager who has seen the influx of microcomputers within his operating units, a new question of support has developed. That question concerns post-training support.

Managers are finding that the concept of hardware is getting easier to digest. The microcomputer is not as intimidating as it once was. You can find them within any department, and they are becoming a necessary part of employees' daily duties. The acceptance of the hardware concept by corporate managers translates into larger budget appropriations for microcomputers and greater willingness by end users to use these newly acquired machines.

With increasing budgets and two years of microcomputer management experience, it would appear that management is ready for each new stage of users. Once again, simply publish the corporate standards for software, make a training facility available, hook up the answering machine, and these users will be off and running.

Sure the same problems will exist. One user wants to use this data base program because he has become familiar with it through his kid's system at home. Ten percent of the users will not be able to attend any of the scheduled classes because of conflicts. The microcomputer manager will find at least 100 calls to return by the time he comes back from his 10 o'clock coffee break, that is if he was lucky enough to get a break.

Operational support

What about all those users from the last two years who are facing a set of completely different problems? These users, who understand the microcomputer and exploit its effectiveness as a productivity tool, face the problem of finding operational support. Operational support can be critical to the daily responsibilities of any department. Management cannot afford to experience downtime at functional levels when the microcomputer has become an integral part of the workday.

The need for operational support at the microcomputer level is really no different from the support that traditional data processing departments provide for the mainframe users. However, there seems to be a psychological barrier to the development of the necessary support at the microcomputer level. The key to management's reluctance in this area is simply a matter of size. Microcomputer software is not viewed the same as mainframe software because of its canned nature, its smaller project time and size and the vendor's willingness and ability to provide initial assistance.

Unlike mainframe software, microcomputer software is physically transportable; but the modifications to the software for application purposes are just as sophisticated on the micro as the mainframe. Once modifications are made to the micro software, someone must be responsible for that application, especially if there are multiple users.

Managers who have passed the buck to outside parties such as the manufacturer or local source have forgotten or not realized that the value of third- party support really ends at the training level. Third-party expertise cannot be expected to extend to the operational factors that were considered in modifying the software.

Budget syndrome

Those managers who recognize the correlation between the complexity of the application and the diminishing value of third-party support must now overcome the budget syndrome. The actual dollar investment in support has generally been based on a percentage or some formula of the total project.

A cost comparison between a microcomputer-based project and a mainframe project can easily distort management's view toward investing in microcomputer support. The fact that a large base of microcomputers has been installed and the additional cost for most micro-based projects is directly related to the quantity of software to be purchased. A standard formula for determining the actual dollar amount for support will produce a series of unwanted headaches.

In the case of micro-based projects, many companies have instead used the size of the targeted end-user community as a measuring stick for determining the amount of money to be allocated for support. This approach provides a more effective basis for budgeting purposes; however, it leaves management with two issues to be considered. First, who will be responsible for the support function of this particular project, the microcomputer coordinator or the departmental manager who has authorized the project? Second, what is the proper ratio of support people to end users that should be followed?

The first issue is common in corporations that strategically use information technology as a weapon in the marketplace. The microcomputer has given many corporations access to new markets by creating diversified services or adding value to existing revenue-generating activities.

One major pharmaceutical distributor, for example, provides many of its larger accounts with an IBM Personal Computer to help in the ordering process.

This service has proved to be a value-added feature by decreasing the buyer's inventory carrying costs

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through increasing the distributor's response time.

Taking this idea one step further, the distributor created an insurance claim processing service that utilized the newly installed base of IBM Personal Computers. This strategy has resulted in a significant percentage increase in revenues from both a stronger account basis and a new revenue-generating service.

The implementation of these types of programs has generally been handled by a strategic marketing or product development group. Whether the microcomputer group was involved depended upon the strength of the department that initiated the project.

Many times there is a need for technical collaboration. However, in the long run it is considered advantageous to have the microcomputer group, which is primarily an internal department, return to its primary function of supporting the corporation's users.

The issue of support in this example now extends to users outside the corporation. It is for this reason that the marketing-oriented department has been given full responsibility in order to respond to market influences and technological factors simultaneously.

Cost control

The strategy of cost control through automating operations addresses the second issue. Cost control is primarily an internal function, and many areas have acquired microcomputers for this purpose. Once such operational functions as financial reporting, interoffice communication and manufacturing control become more dependent on the microcomputer, system maintenance will be critical to everyday operations.

Unlike the mainframe applications, hardware downtime is not as critical because of the availability of other stand-alone units. However, the main emphasis from an operational standpoint is in the area of monitoring users and not necessarily maintaining the equipment.

The term "micro" itself implies smaller applications and results in several applications being applied by several individuals at a number of locations. Unfortunately, this means that users must be provided with differing levels of instruction.

Because so many variables have entered the computing environment, a greater amount of control must be administered. Control, in this sense, is simply a function of adequate support, and support is a function of people.

Once management identifies the need for a support staff, whether for internal operations or newly created marketing programs, it must tackle the issue of how many people are needed to support the user community. The first consideration depends upon the current support structure within the organization. By examining the two most common structures, the informal network or the formal support group, a differing set of philosophies surfaces.

Two philosophies play an important factor in determining the direction that corporations will take in establishing their support programs. The proactive approach is where the user community dictates the direction of microcomputer usage; the authoritarian approach is where the corporation provides the foundation.

The informal network is most common in companies where "micro gurus" from throughout the organization took charge of microcomputers from the beginning as a secondary responsibility to their duties within their own departments. User groups began to form through which many of these gurus came forward.

At the same time, it was not uncommon to hear of a financial analyst or a personnel administrator being elevated to microcomputer manager. Although some formality in support was developing, the user groups acted as the primary support

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network. This proactive approach has been quite effective, however, as the issues of standards and networking have become prominent.

As the size of the user community has grown, the gurus have not been able to support the microcomputer program as a secondary responsibility. Thus, the need develops for increasing the ratio of support staff to end users.

Now politics becomes a factor. Will the gurus accept positions as full-time support specialists without distorting their perception of their own career paths? What is the cost to the corporation for removing them from their functional responsibilities?

In the case of supporting the marketing programs, an argument in favor of formally supporting these end users with the appropriate experts is easily made. As a revenue-generating activity, justification is easy, and a career path can easily be identified. However, in support of the operational functions, some sort of designated staff needs to be carefully developed.

In order to develop cost-effectively a support program to assist the operational functions, a set of standards is needed. For those organizations that have already taken an authoritarian approach, a general support plan has been a key element in taking control of the user community.

The idea of support has been effectively used to implement a standards program, especially where there are many remote users without access to assistance. A published list of products is made available to the end-user community, and it is made known that the corporation will provide the necessary assistance on these products and these products only through some sort of "help desk." If the user chooses to go his own way for his particular project, he must be prepared to go elsewhere for assistance.

The concept of the information center fits in nicely with the development of a microcomputer support program. Such centers have helped the end-user community evaluate software packages and provide troubleshooting assistance.

Although it is becoming very costly, management has staffed these centers on a rotating basis to prevent ambiguous career paths. Even with the incorporation of microcomputers into information centers, a deficiency still exists. Support seems to end at the user's applications.

An attempt to solve this problem could very well result in the development of whole new departments just to support individual applications. Given management's overall view on microcomputer expenditures, this development could result in tremendous justification problems, especially with the existence of a microcomputer department, a training group and now an information or microcomputer center.

What does tomorrow's technology and its users have in store for today's microcomputer manager? Obviously, there will be a tremendous investment in the area of end-user support. Investments made to support mainframes have been around for years. However, these investments will not be seen until the corporation defines the microcomputer as an extension of the mainframe with the same capabilities.

About the author

Steven Hochberg is the Midwest regional director of the Microcomputer Managers Association. Chapters are currently active in Chicago, Detroit, St. Louis, Minneapolis and Cincinnati.

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Three systems for mainframe

Compatibility between CBT systems is one of the major factors to consider in choosing a system. Compatibility is especially important if you plan to take advantage of the many off-the-shelf CBT courses currently available.

If off-the-shelf courses meet your requirements, they are much more cost-effective than authoring your own. However, you must make sure that the courses you wish to use have been authored in a language that can be presented with the presentation system you plan to install (see Figure 1 on Page 48).

There are three instructional systems for the IBM mainframe. A complementary micro system currently exists for each system or one is being planned. The three systems are IBM's Interactive Instructional System (IIS), Goal System International, Inc.'s Phoenix and Boeing Computer Services Co.'s Scholar/Teach 3 (S/T3). Features of the three systems are summarized in Figures 1 and 2.

IBM's Interactive Instructional Systems include the Interactive Instructional Presentation System (IIPS), which executes on IBM 30 series, 4300 and mainframe-compatible systems. The package includes extensive administration features. Only courses written with the Interactive Instructional Authoring System (IIAS) or Personal Computer Instruction System (PCIS) can be presented on the Interactive Instructional Presentation System.

The Interactive Instructional Authoring System executes on IBM's 30 series, 4300 and compatible mainframes. Courses authored under the Interactive Instructional Authoring System can be presented with the three mainframe presentation packages and the Personal Computer Instructional System for the IBM Personal Computer.

The Personal Computer Instructional System, the latest addition to the IBM Instructional Systems, operates on the Personal Computer and is compatible with the Interactive Instructional System mainframe Course Structuring Facility, a high-level macro language for authoring. The Personal Computer Instructional System can be purchased in these modules:

- Personal Computer Instructional System/Presentation
- Personal Computer Instructional System/Authoring
- Personal Computer Instructional System/Administration

A unique feature of the Personal Computer Instructional System is that it provides the link between the mainframe and the Personal Computer. Courses can be authored and presented interchangeably on either the mainframe or the Personal Computer. For example, courses can be written using the Personal Computer and presented via the Personal Computer or mainframe.

Goal System International's Phoenix System includes the Phoenix Authoring System, which executes on the IBM 30 series, 4300 and compatible systems. Courses authored with Phoenix can be presented on either the Phoenix mainframe or PC Presentation System. The Phoenix Presentation System also executes on the IBM 30 series, 4300 and compatible systems. The mainframe Phoenix Presentation System can present courses converted from the Interactive Instructional Systems as

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well as those written under the Phoenix Authoring System. The Phoenix Presentation System includes administrative features.

The Phoenix Micro System was announced for the fourth quarter of 1984. This stand-alone micro presentation version of Phoenix will present courses written under the Phoenix Authoring System on the mainframe.

• **Boeing Computer Service's S/T3** includes the S/T3 Authoring System, which executes on the IBM 30 series, 4300 and compatible systems. As with Phoenix, courses authored with S/T3 can only be presented using the S/T3 Presentation System. The S/T3 Presentation System can be purchased separately from the S/T3 Authoring System. It can present courses converted from the Interactive Instructional Systems as well as those written with the S/T3 Authoring System.

The S/T3 Micro System will provide upload and download capability from the mainframe to the micro and vice-versa. Courses written on the S/T3 Micro System can be presented on the mainframe using the S/T3 Presentation System; courses authored on the mainframe using the S/T3 Authoring System can be presented on the S/T3 Micro Presentation System as long as each course can be contained on a single diskette.

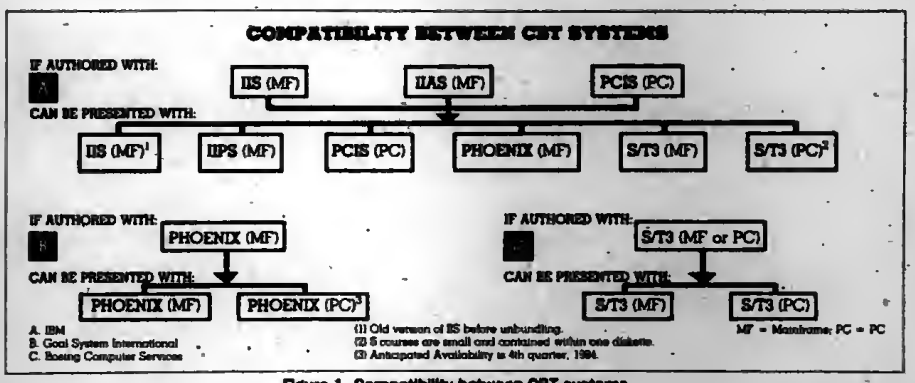

Figure 1. Compatibility between CBT systems

SYSTEM:	IBM		GOAL SYSTEMS		BOEING COMPUTER SERV.	
FEATURE:	IIS (MF)[1]	PCIS (PC)[1]	PHOENIX (MF)[1]	PHOENIX (PC)[1]	S/T3 (MF)[1]	S/T3 (PC)[1]
Authoring on MF, Presentation on MF & PC (Download)	Y	Y	Y	Y	Y	Y[2]
Authoring on PC, Presentation on MF & PC (Upload)	Y	Y	N	N	Y	Y
Menu-driven Authoring	N	Y (opt.)	Y	N	Y (opt.)	N
Batch input (off-line development)	Y	Y	N	N	Y	Y
Color	Y[4]	Y[3]	Y[4]	Y	Y	Y
Graphics	Y[5]	Y[6]	N	Y[7]	Y[8]	Y
Reporting Student Activity	Y	Y	Y	N	Y	Y
# Screens/diskette		250[9]		150		172
Costs: Authoring system	$430/mo	$525/copy	$1000/mo			
Presentation System	$251/mo	$ 85/copy[10]	$ 250/mo	$535/mo[11]	$ 250/mo	$ 95/copy
Combined with Admin.	$681/mo	$1010/copy	$1250/mo		$1000/mo	$495/copy

Notes:
1. MF = IBM Mainframe; PC = IBM Micro
2. Courses authored in S/T3 mainframe can be downloaded and presented on the PC if the courses do not span diskettes.
3. For an additional $25, PCIS supports the full range of colors.
4. Phoenix and IIS on the mainframe use three colors: red, white, and blue.
5. Graphics are supported in IIS through the IBM GDDM language.
6. Graphics for PCIS using all points addressable is scheduled for third quarter '84 update release.
7. PC Phoenix will support graphics in a future release.
8. Graphics capability is scheduled for release for the mainframe version of S/T3 fourth quarter 1984.
9. The next release (third quarter '84) will double the screens per diskette to 250.
10. PCIS prices are based on a one-time charge per PC.
11. $535/month for the Phoenix micro presentation system provides for an unlimited number of copies for micros.

CHARTS COURTESY CRWTH COMPUTER COURSEWARES

Figure 2. CBT authoring system features

Menus for learning

The availability and comprehensiveness of menus also influences selection of a CBT system; however, the importance of menus is often overestimated. Menus are most effective not for authoring but for learning how to author. For the inexperienced author, menus provide excellent training. Prompters help teach users keyword parameters essential for authoring.

This method is especially useful for novice authors or for individuals who will write only one course. However, as authors gain experience, it is far more productive for them to concentrate on creating the course rather than inputting it. In other words, the ability to batch input becomes more important. Batch input allows a course to be developed off-line using a powerful text editor on the mainframe (such as IBM's Xedit or ISPF) or using an editor such as Micropro International Corp.'s Wordstar on the Personal Computer. The source is then batched directly to the authoring system. There are obvious advantages to batch. For example:

- A data entry person can enter the course material into a text editor much faster and more economically than an author can use a menu-driven authoring system.
- A Personal Computer text editor can access a spelling routine.
- Developing the source material using a Personal Computer text editor can be extremely cost-effective, especially if the training department would otherwise be charged back for mainframe CPU time.

Few of the CBT systems discussed above offer both menu-driven authoring and batch input. With IBM's Personal Computer Instructional System, the author can select the Course Structuring Facility menus or bypass them and batch the input directly into the Personal Computer Instructional System. The mainframe version of Course Structuring Facility does not provide menus but does allow for batch input.

Boeing's S/T3 Authoring System executes on both the mainframe and Personal Computer, but optional menu-driven authoring is only available for the mainframe version. Batch input is supported in both versions.

Goal's Phoenix system (mainframe only) uses Ease as an authoring language and is completely menu-driven. Both the authoring system and the presentation system contain display menus on the last four lines of the screen. No batch input is supported.

Variables such as cost, color options and graphics may influence the selection of a CBT system. These variables are summarized in Figure 2. By analyzing your training needs and then choosing the system that meets those needs, you will ensure the success of your CBT program.

About the author

Marsha Seidman is president of Crwth Computer Coursewares, a Santa Monica, Calif., vendor of interactive CBT for information center end users.

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EDITORIAL

IBM's dowry, AT&T's thorn

The groom is middle-aged, clean-shaved, close-shorn. The bride is young, free, almost countercultural. The wedding will be on Wall Street.

IBM's proposed purchase of Rolm Corp. may affect the shareholders of AT&T more than the owners of either IBM or Rolm stock. While AT&T fends off Judge Harold Greene with one hand and gropes for a salable technology with the other, IBM is poised to take a giant step into the future.

IBM is the largest computer vendor in the world. And Rolm is no small potatoes in the private branch exchange arena.

Once the marriage is consummated, IBM will possess a dowry of PBX technology second to none. Suddenly, an IBM Cabling System based on twisted pairs makes a great deal more sense.

Ever since the dust settled around the advent of the Personal Computer and its siblings, IBM watchers have had little to do other than speculate about the long-awaited Sierra line — the anticipated next generation of IBM mainframes — and about IBM's network schema.

In the 10 years since its debut, Systems Network Architecture has come to dominate the world of protocols, even to the extent of making negligible the efforts of national and international standard-setting bodies like the International Standards Organization and Ansi. When IBM sneezed SNA, these august bodies said, "Bless you."

For years, IBM has dominated the DP market. There was a short spell when things got interesting in the microcomputer segment, before IBM had a presence there; but within two years of the introduction of its Personal Computer, IBM was at the top of the charts across the board again.

But these days, IBM is in a different kind of game. The Japanese are making an all-out, government-backed effort to change the rules with a totally new fifth-generation technology. And there's a new kid in town.

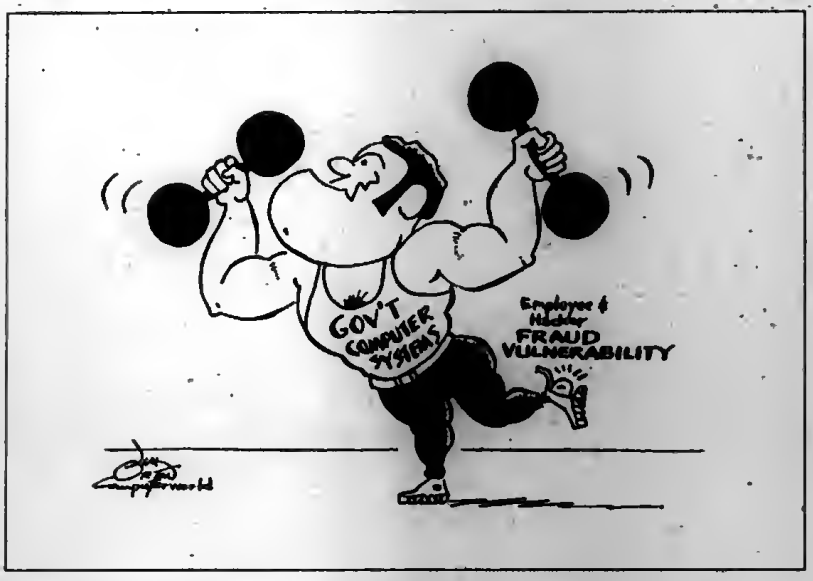
Despite all the alternative vendors could do to stop it, AT&T is loose in a free market, not just looking to compete, but looking to go for all the marbles. It's going where the action is, and that's at the place where computers and communications meet.

Now there are two powerhouses on the same block. Each one is coming with a strong, viable corporate culture that sets it apart from almost any other corporation in the country. Each is coming from a corporate tradition and a corporate stance grounded on the concept of service. Each is starting from a dominant, saturated position in its market. Each had only one other place to go for the big bucks — the other guy's turf.

AT&T threw its first punches with the Net 1000, the System 85 and its personal computer from Olivetti Corp. IBM countered with its Cabling System and now with the acquisition of Rolm. The announcement of a local-area net, long awaited, may be only a short time off.

AT&T, still involved with the courts, is operating under a disadvantage: Its every step is scrutinized by lawyers and judges. IBM has successfully skirted any real entanglement in the legal process since the U.S. government dropped the antitrust case two years ago; IBM can act unhampered by a court, letting the market be the judge and jury of its actions.

However the battle turns out — and we're making no predictions here — it is about to begin. Whether the computer industry and DP users will be any better off from it is a question with which everyone is still wrestling.



LETTER

Recruiting from government

I was interested in the article "Red tape, competition hurt federal DP recruitment" [CW, Oct. 10].

I am a principal in an exclusive technical recruiting firm specializing in DP personnel and have "worked" the Washington, D.C., area for many years.

In compensation matters, with only very few exceptions, we find government employees' salaries to be leading rather than following the pack, and they are higher than those generally found in the business sector.

Combine the salaries with the well-known generous government benefits package, which includes good working hours, a very liberal vacation and pension plan, and very few longtimers ever want or can afford to leave government for the private sector.

As a recruiter, I find the only people who are recruitable in government are the short-timers who are frustrated with the bureaucracy, the attitude of their fellow employees and/or the often antiquated systems and equipment.

Though few will state openly, it is interesting to note that many firms have an unwritten rule that they will not hire someone out of government. Interesting?

Tom Kay
Salem, N.J.

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VIEWPOINT

Election update

LECHT ON SCIENCE
Charles P Lecht

Maybe I'm just getting older. Or maybe I'm just getting tired of watching the same old show every four years where our presidential candidates reenact an electoral process that has all the excitement of an 18th century minuet, powdered wigs and all. But it's about time we updated the whole affair or it may cease having the appeal it used to have and the most basic virtue of our democracy — the right to vote — may perish. Dwindling interest by Americans young and old in exercising their right to vote may, in my view, be traced to their feelings of futility in doing so. The current system of registering voters and asking them to go to the polls to cast their ballots is so out of synchronization with what's happening technologically everywhere else in our lives, that it is hard to muster a lot of enthusiasm to participate in it. And because of this, great wells of skepticism that the single vote has anything to do with the outcome of an election are emerging.

Protests of what the American people want by candidates employing the most modern technology to convey their cases for election are unconvincing to an increasingly educated electorate who knows only too well the powers that pollsters armed with computers may bring to bear on a candidate's behalf. As we watch our television screens during national debates, everywhere we see the telltale wires and cables of modern computer and communications technology. Everywhere candidates or their surrogates sit talking to one another utilizing the most advanced teleconferencing facilities, shamelessly employing the most archaic methods of appealing to the public for their support on election day. I believe these methods to be discouraging to our educated population that knows dealing with issues like arms control and aggression by the Soviet Union has little to do with arm waving, toothy grins and self-righteousness.

As voters go to the polls in the Midwest and Far West knowing what the various pollsters are saying about what's happening in the East before it's all over, they might be disposed to vote by pollster results rather than on the issues — Americans may be for the underdog alright, but never for the dead dog.

On the teleconferenced wrap-ups on the major networks we watched the faces of political analysts as they said the expected in about the most ho-hum, boring and predictable format known to man. After one of the recent presidential debates I thought I saw McNeal of the famous McNeal/Lehrer Report show a touch of bemused boredom as he asked each of the two interviewees in his studio how they thought it went and each claimed his hero had won or certainly hadn't lost. That many Americans feel alienated from the election process may reflect their feelings of dismay over the manner in which we conduct our election campaigns, but I don't believe that this is the major reason.

I believe that they despair that their vote may have no meaning in the scheme of things. With all this modern technology around, they've yet to hear a candidate seriously suggest its employment to overcome the biggest difficulty in the conduct of our elections — namely in the process of how we cast our votes.

In the earliest years of our country it must have been an exciting event when, on horseback, riders appeared in Washington carrying voting results from outlying places to elect a new president. There must have been a certain element of suspense associated with the whole process: Would the rider make it at all or in time to cast his constituency's votes?

Voters felt their ballots counted

It's hard to understand how political campaigning took place before the iron horse or the telegraph, but we are told it did. And voters had a feeling that their ballot had a role in who got elected. One thing must have been certain: the results of voting in the East, or anywhere for that matter, could have had very little effect on voting elsewhere; until long after the election was over no one knew for certain which place had voted how, much less who had been elected.

Spread as we are now over seven time zones with most of our population in the East, it's hard to see why anyone way out West would want to take the time to go to the polls to cast a vote in our national election when the winner had been decided before he left home to do so. Recent studies have shown that such foreknowlege of a presidential victory by voters in the West can alter the results obtained in voting on local issues by as much as thirty percent.

It's hard to believe that our founding fathers intended that our presidential race would so affect local issues — they were Federalists from the start. Or as our great nation got even greater, that technology should be used to disenfranchise our western population insofar as the presidential election goes.

Modern computer and communications technology cannot be faulted as the villain, nor can the

See ELECTION page 52

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

Crosscurrents in data center employee relations

HUMAN CONNECTION
Jack Stone

The passage of a new contract between General Motors and the United Auto Workers (UAW) signals a new era of dealings between labor and management in the auto industry. Some of the specifics have overtones which may apply in the large computer centers, but more importantly, the radical change in goals by both sides should encourage computer center managers to take a fresh, if not, bold new look at how they are dealing with their staffs.

It is a fact that very few centers are unionized — recent statistics suggest the order of 5% — presumably for the reason that DP professionals believe that their economic well-being, working conditions and job security are best achieved through a one-to-one relationship with their managers, as opposed to collective bargaining. Of course, this attitude is totally consistent with their notion of professionalism, one grounded in bedrock independence; and it is further typical of a labor force whose skills are in such high demand that workers are in the driver's seat when it comes to negotiating with employers for financial compensation, fringe benefits and the tools of the trade.

But aren't there indicators in the winds that suggest at least the sense of change, where demand for DP personnel — at least for the journeyman Cobol programmer vintage — tends to be ebbing, rather than flowing? Are there not suggestions that the continuing rise in salaries may be tapering off a bit? Let me recite a few possibilities:

Aren't there indicators in the winds that suggest demand for DP personnel — at least for the journeyman Cobol programmer vintage — tends to be ebbing, rather than flowing?

- The gradual emergence of the new procedural languages have substantially cut development time and, just as important, requirements for maintenance resources.
- The recession during 1981-1983, which surely was not a great period for job-hopping or recruiting gave computer center managers a fairly stable work force.

As a corollary to the above, there exists the ardent determination of the executive suite to keep salaries steady, consistent with the low level of inflation, to protect profitability.

- The rapid increase in decentralized, packaged office systems and personal computers has transferred much of the low-level systems work from the shoulders of the DP staff to technician-level clerks and secretaries — or eliminated needs for their assistance altogether through the miracle of modern-day electronic automation.
- The development of intelligent networks has encouraged the distribution of the processing work load formerly processed at a few central sites.

Lessening in demand for DP resources

It is not my conclusion that the real DP work load is getting any less, rather that the myriad of smaller projects — those amendable to solutions by distributed systems, in the generic sense — which the center placed into its backlog, but never entered into the active work queue, are being eliminated. In this sense, there is a perceptible lessening of demand for DP resources.

It seems to me that if a trend indeed develops which signals a significant leveling off of a need for personnel, then the DP personnel may take another look at negotiating powers and check into the pros and cons of establishing a bargaining unit. And why not? Wouldn't they be following in the footsteps of loosely parallel situations in the auto and mining industries?

nerability, such as (and I use quotes for UAW terms, parentheses for DP terms): "automation" (distributed systems), "outsources" (packaged software), "wage stability" (salary caps), "foreign competition" (industry competitive forces) and "employment security" (downgrading of jobs and layoffs)? ‡

Stone is an independent management consultant, educator and writer, specializing in DP human communications and personnel development, based in Washington, D.C.

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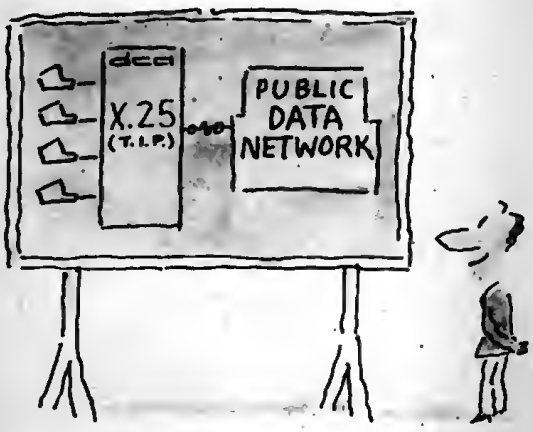

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VIEWPOINT

ELECTION from page 51

press. But together they do provide us with the circumstances which create the absurdity of, say, asking a Hawaiian or Alaskan voter to go to the polls reading his daily newspaper's account of who won the same presidential election in which he has yet to cast his vote. Clearly, something has to be done to rectify this situation. If we could suspend the earth's rotation for a day so that it would allow time-independent balloting, it would help, but no one knows how to do this.

And suspending the press so that the Western part of our country is kept in the dark insofar as what happened earlier in the East won't work either. Fundamental to our liberty is a free press, but even if we elected to muzzle it for a day or two we would have to do a lot more muzzling to give Westerners a chance to feel they've participated in an election that wasn't already over.

For example, we'd have to suspend telephone service, our airlines and our computer time-sharing networks, not to speak of all communications abroad. And for what? Just so our Western citizens were provided with the thrill of casting their national election votes with the feeling that these might make a difference in who was elected.

Providing everyone west of our Eastern seaboard with a ticket to go east for election day won't work either. Of course, we could start balloting in the Midwest, say at daybreak in Winfield, Kan., but the long lapse in time as the sun raced across the Pacific Ocean, China, Europe and the Atlantic to our eastern shore would create a two-day voting process and, I suspect, two elections. As voters go to the polls in the Midwest and Far West knowing what the various pollsters are saying about what's happening in the East before it's all over, they might be disposed to vote by pollster results rather than on the issues — Americans may be for the underdog alright, but never for the dead dog.

Location-independent election system

A location-independent national election system is required, and the technology to implement it is here — so why not get on with it? Polling places could be provided with automatic polling machines much the same as banks are providing us with automatic teller machines. Americans could be given a 24-hour time period to key in their vote whether in the East or West or somewhere in between. We could get rid of the political hacks that run the polling places just as we've relieved ourselves of the need for tellers. We could eliminate the anomaly of the electoral college which was, as everyone knows, put in place with less than pure purposes in mind.

Since the press would not enjoy the advantage of knowing exactly where and when our votes were being cast, early predictions of victory would be less likely to be accurate, and voters would be spared the disincentive to vote that our current system provides our Western citizens.

Also, this would allow us to clean up our ballot to enable our national elections to take place at different times than those on local issues. Thus, the negative effects of combining so many issues on one ballot could be avoided. Voting by registration card similar to our bank credit card would relieve us of all the ceremonial flimflam that accompanies today's voting process and would make it a lot easier and, of course, more private.

No doubt the system I propose has its problems too. But compared with the current system, it's certain to reinvigorate our interest in voting. And in a few years when home computers are available everywhere and on-line as are our telephones today, we can eliminate the need for paid political analysts to tell us our opinion of who won during televised debates, the likes of which we've recently seen. Voting on each debated issue, we could provide a real-time opinion of each candidate's capacity to govern or not and, by the number of votes, an indication of whether anyone's watching anyway.

SOFTWARE & SERVICES

IBM unveils version of TIF for MVS/TSO environment

WHITE PLAINS, N.Y. — IBM's Information Systems Group has announced an IBM MVS/TSO version of The Information Facility (TIF) application development software.

According to a spokesman, TIF MVS/TSO is functionally similar to the existing IBM VM version of TIF, but operates in the MVS/TSO environment with IBM's ACF/Vtam. The addition of this version is said to provide a TIF product line that addresses the VM/CMS and MVS/TSO departmental-size systems as well as central host computers and the IBM Personal Computer XT/370.

Users can create applications containing TIF commands in one environment that are portable to another environment using the same applications and data.

TIF is said to provide users with an environment that allows for the creation of applications without the need to write programs. Applications generated by TIF cover a broad range of functions from simple applications using system defaults to complex user-customized applications. For simple applications, users need only specify information through full screen menus. TIF generates application specifications including default screen designs and report layouts.

If the user requires additional application tailoring or functions, the generated specifications can be modified to provide complete control of screen design, report layouts, application flow and the addition of arithmetic and program logic, IBM said. Both a menu-level and a command-level interface are provided with the system and any TIF function is accessible through either menu or command. TIF also provides three sets of menus, each of which provides access to TIF functions.

TIF MVS/TSO features include the ability to create applications tailored to unique needs, interactive information management facilities, facilities for user definition and entry of data and built-in report generation, analysis and data selection functions. The initial license charge for TIF MVS/TSO is $4,000, with an additional monthly license charge of $1,000.

More information is available from IBM, Information Systems Group, National Accounts Division, 1133 Westchester Ave., White Plains, N.Y. 10604.

Lifting the fog on subject data bases

SOFTLINE
William Inmon

There is a lot of discussion in the industry and the press today about data bases and almost universal agreement on their merits. Implemented properly, subject data bases have very few limitations and major benefits, primarily in the development and maintenance of applications and in lessening the need for data synchronization.

But there is a paradox: While agreement on subject data base utility is widespread, there is very little agreement on exactly what a subject data base is.

Part of the confusion stems from the fact that because subject data bases are so intuitively appealing, their use is obvious to most people. But at the moment of design, inadequacies and inconsistencies arise when there is a dependence on intuition, because one person's intuition is not the same as another's. One person's definition does not necessarily match another's.

See DATA page 67

Inmon is a director at Coopers & Lybrand in Denver, a noted author on the subject of data base design and a regular contributor to Softline.

SOFTALK
Paul Gillin
Old Spiner Editor

'AI' term plagues software arena

Just when it was beginning to look like 1984 would be free of new software buzzwords, an unfortunate trend has emerged. Perhaps a dozen product announcements have crossed our desks in the last month claiming to have artificial intelligence capabilities. Increasingly, firms are tossing the term AI around with almost casual abandon.

Misrepresentation of this fledgling technology can only confuse customers. Unfortunately, buzzwords have traditionally had a way of infesting the software industry. A few years ago it was "user-friendly," followed by "English language," then "fourth generation" and "integrated." Next year you can be sure to see AI taking its place among these poorly defined and overused labels.

But the misuse of the AI definition is particularly damaging because it is so fundamentally misleading. There is already too much confusion in the market about just what AI is.

Generally, we can agree that it represents a giant step forward in the use of computers, one which will drive the industry into the next century. AI systems will be able to make decisions that previously could be made only by humans. They will take the computer beyond the concept of calculation and into the realm of reasoning.

But where do you draw the line? At what point is "artificial intelligence" an appropriate description for a piece of software? (See story page H)

AI engineers will tell you that AI engineering involves a very specific kind of programming that approaches problems in a different way. An AI system must fundamentally tolerate ambiguity and uncertainty. More important, it must be able to draw conclusions without using a

See AI page 70

■ IBM has announced a series of enhancements to its graphics software offerings/56

■ Tandem Computer, Inc. has enhanced its Enable program generator to access multiple data base files simultaneously/60

■ AT&T has released two packaged applications for its Net 1000 network/60

■ Users of Computer Associates International, Inc.'s CA-Executive can now optionally add a more powerful spreadsheet/61

INSIDE

Systems Software/62

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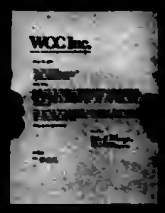
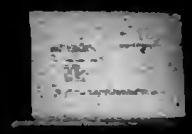


Word processing.



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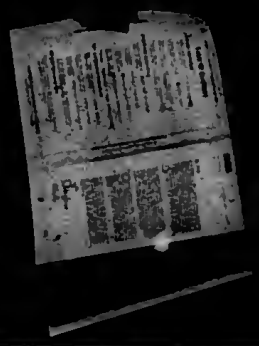

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HEWLETT PACKARD

BD02431

IBM enhances design and modeling hardware, software

WHITE PLAINS, N.Y. — IBM has announced a series of products and enhancements to its hardware and software for engineering design and modeling.

Major features include three-dimensional modeling capabilities for the Computer-Graphics Augmented Design and Manufacturing (Cadam) licensed program, a version of the Computer-Graphics Aided Three-Dimensional Interactive Application (Catia) licensed program and improved telecommunications facilities for operations using the IBM 5080 workstation.

Three major enhancements to the IBM 5080 Graphics System were announced. They are: remote attachment over teleprocessing lines, an IBM 3270 data stream capability added to the IBM 5088 Graphics Channel Controller/5085 Graphics Processor link and support for attachment of the 5080 system to the IBM Cabling System.

The 5088 Remote Controller Model 1R and remote 5085 V.35 attachment single workstations offer new configuration flexibility, according to IBM. Only one modem is connected to the 5088 Model 1R and the V.35 interface. The 5085 workstations can be attached up to 5,000 meters away, IBM said.

Same physical connection

With the 3270 Mode Shared Attachment, graphics and 3270 data stream applications may use the same physical connection between the 5088 or 5085 in both local and remote modes. The 5088-to-5085 serial link connection is used for 3270 model shared attachment. The 3270 support provides a facility for job initiation for IBM's engineering modeling systems.

A 5085 Graphics Processor costs $15,000 with additional charges of $1,000 for V.35 attachment (plant installed) and $3,500 for V.35 Remote to Local attachment. A 5088 Channel Controller costs $13,000 for a 16-terminal version and $20,000 for a 32-terminal version. The 5088 Remote Controller costs $7,800.

The Cadam 3D Interactive program, which enhances Cadam, is said to allow easier construction, modification, analysis and display of three-dimensional geometry. Both three-dimensional and two-dimensional models share similar modes of operation, IBM said. Any view of a three-dimensional object from any angle can be specified. A model may contain both two- and three-dimensional geometry. The product carries a one-time, single-user charge of $35,000.

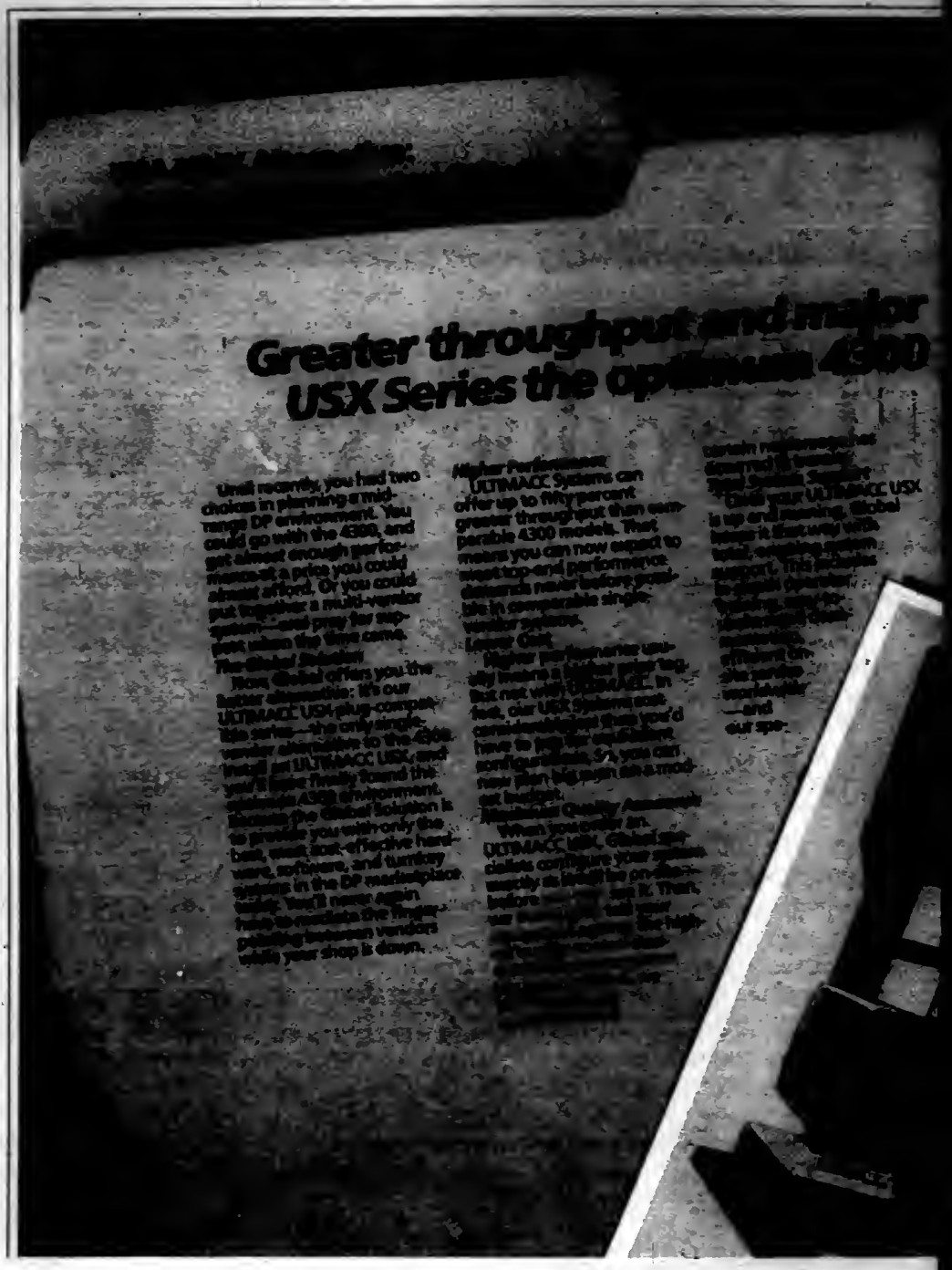
Catia Version 2 Release 1 is said to be an interactive, high-function three-dimensional geometry, solid modeler and drafting system for computer-aided design and manufacturing applications. The software consists of 12 enhanced programs including three with new three-dimensional capabilities: Advanced Surfaces, Solids Geometry and Basic 3D Design.

The three-dimensional design capabilities of Catia can be used to display shapes on an IBM 5080 more realistically than before, to translate them into a prototype through Catia's numerical control techniques and to create final drawings with Catia's new drafting module.

For the entire package of 12 programs, the initial charge for a single license is $18,240. The monthly charge is $7,820.

IBM also announced Computer-Aided Engineering Design System Modeler, a program that permits designers and engineers to construct solid three-dimensional models that can then be analyzed on the screen for aesthetics, space, weight and performance characteristics. A broad library of geometric construction aids are provided. An initial license charge costs $7,200 with a monthly charge of $2,400.

IBM's National Accounts Division is at 1133 Westchester Ave., White Plains, N.Y. 10604.



Study sees 35% growth in manufacturing systems mart

By Donna Raimondi
CW Staff

FRAMINGHAM, Mass. — The manufacturing information systems market jumped from $1.82 billion in 1982 to $2.45 billion in 1983, and International Data Corp. (IDC) predicts that the market will sustain a 35% growth rate for the next few years before tapering off toward the end of the decade.

Rapid market growth spurred an intensely competitive vendor environment, according to IDC's recently released "Manufacturing Information Systems Overview."

Manufacturing systems based upon Material Requirement Planning II (MRP II) methods showed signs of moving toward smaller systems in 1983 and also exhibited a trend toward rapid growth of microcomputers in manufacturing. Software costs in the software/hardware cost ratio climbed to 27% in 1983 from 13.5% in 1982, according to the report.

The overview also showed that minicomputer-based systems presently dominate the market (71.9%), followed by mainframes (19.6%), with microcomputers holding the smallest share (8.5%).

Independent vendors

While IBM systems account for 50.3% of the U.S. manufacturers' worldwide installed base, the marketplace is rapidly becoming dominated by independent software vendors. These vendors have garnered over half of the installed systems base and represent the fastest growing segment: 50% since 1982. The microcomputer segment of the market is represented in its entirety by independent software vendors.

The largest user industry is electronics/instruments, which accounts for 25.7% of the market, followed by automobiles and parts, at 11.2%; machinery/tools and aerospace/defense, both at 10.7%; and fabricated metals at 10.5%.

The "Manufacturing Information Systems Overview" gives IDC's Continuous Information Services clients an annual review of the market for manufacturing planning, control systems and software. It is the result of telephone research conducted from February to April this year. IDC surveyed 110 independent software suppliers and 10 hardware vendors selling integrated manufacturing/MRP II packages.

The price of the "Manufacturing Information Systems Overview" is $1,000. More information is available from IDC, 5 Speen St., Framingham, Mass. 01701.

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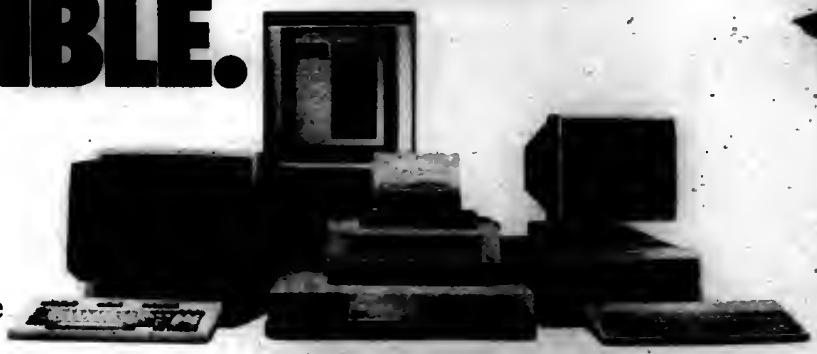

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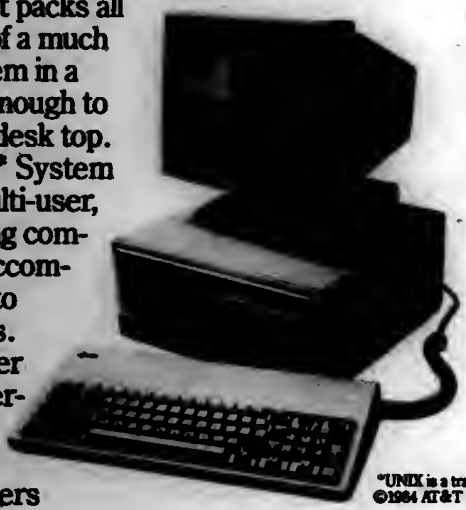

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And meet the new AT&T Personal Computer. What makes it special is its ability to combine high performance with excellent

UNIX

graphics capabilities, an adjustable display monitor, and non-glare screen. Its flexibility allows it to operate as a stand-alone unit or as part of an integrated computer network. And its compatibility allows it to run most popular business software, including most available MS-DOS** applications.

THE FAMILY THAT WORKS TOGETHER

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Each family member works together in a coordinated system, making tasks easier

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and users more productive. All AT&T Computers are based on our Information Systems Architecture, an open, communications-based structure that can accommodate and integrate not only our products, but also those of other manufacturers.

UNIX

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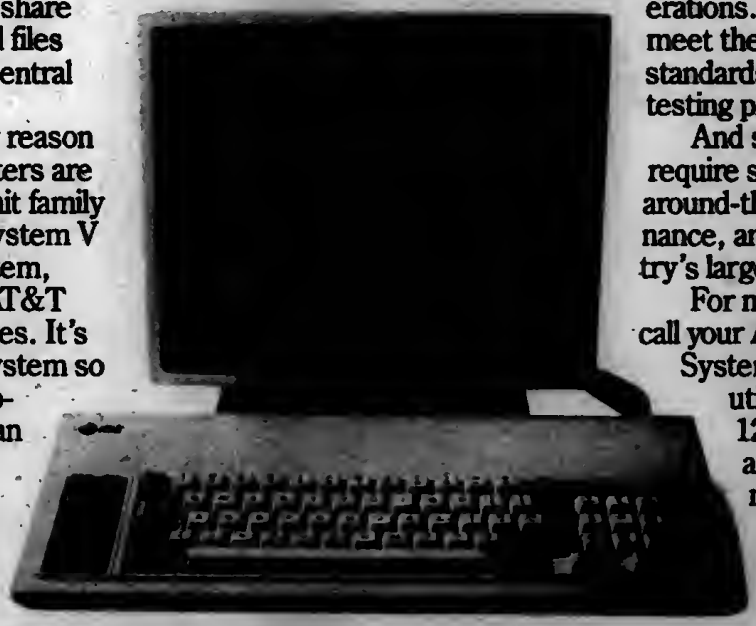

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MS DOS

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AT&T

Tandem tool enhanced

CUPERTINO, Calif. — Tandem Computers, Inc. has announced a series of enhancements to its Enable program generator, said to automatically generate programs for user interaction with a Tandem data base.

According to a spokesman, Enable users can now generate programs that can access many different data base files simultaneously. Enable-generated programs can also link different parts of a data base to create more sophisticated applications without user programming.

Other enhancements reportedly include improved control of the terminal screen layout in Enable applications. In addition, different fields within the screen can now be suppressed for security or to leave a clear view of data, according to the spokesman.

The enhanced version of Enable is compatible with Tandem's Nonstop II and Nonstop TXP systems and can be ordered separately or as part of Tandem's Encompass data base management system. Enable is priced at $1,500 per processor with a $55 basic monthly maintenance charge. Encompass, including Enable, is priced at $8,000 per processor with a $265 monthly maintenance charge.

Tandem is located at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

'He can't be too far, this videogame is still warm.'

PROGRAMMING IN DECISION TABLES

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Fred, What do we know about this?
Joe.

AT&T unwraps transaction support packages

MORRISTOWN, N.J. — AT&T Information Systems has announced two packaged applications for network services directed at supporting the transaction needs of domestic and international business. The services are applications that reside on AT&T's Net 1000 network.

AT&T Mortage Services allows banks and mortgage and real estate companies to obtain current mortgage rates and prices for borrowers and prequalified borrowers and enables them to send loan applications for approval, the firm said.

AT&T Interchange Services is said to provide for host-to-host and terminal-to-host electronic data exchange in industry-supported formats.

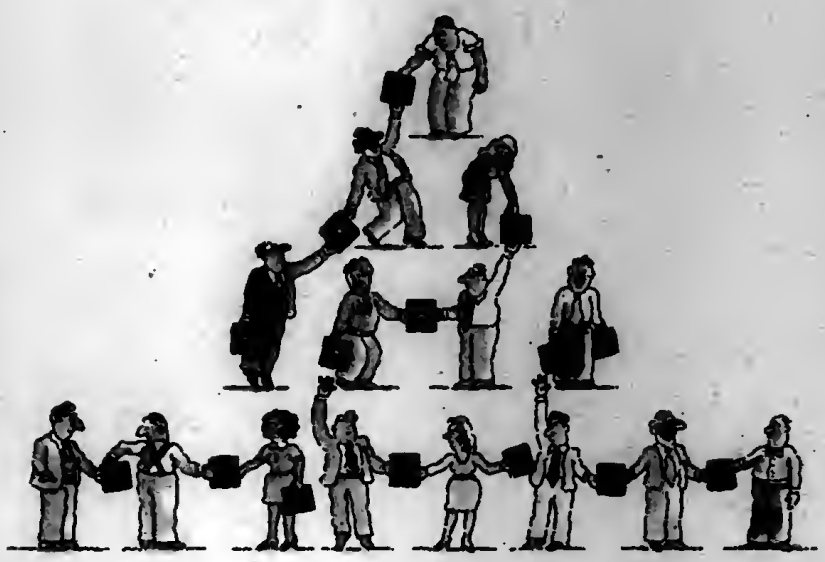
An additional feature maintains product catalogs on the network, allowing users to search for items and place orders directly to the vendor on a nationwide basis using existing industry standards, according to the company.

The AT&T Mortgage Services are priced from 50 cents to several dollars per transaction, depending upon functions.

Prices for the AT&T Interchange Services vary up to $1 per transaction, depending on the volume.

More information is available from AT&T Information Systems, 100 Southgate Pkwy., Morristown, N.J. 07960.

THE END OF SOFTWARE FREEBIES.



Finally there's a foolproof way to protect software against unauthorized duplication. And the technology is all on the disk itself.

The new Prolok™ disk doesn't need add-on hardware. Instead each diskette is marked with a unique, physical "fingerprint." No two are alike. A precise description of the individual print is encoded magnetically. The fingerprint AND the description must match exactly before the software is decrypted and released to the system. No match, no access.

Its genius is its simplicity and familiarity. Prolok looks like an unprotected disk, loads like an unprotected disk, works like an unprotected disk. The user feels immediately at home and in command. It's as easy as A>PROLOK B: filename.

Backups are easily made via normal system utilities. However, to be read they must be accompanied in the system by the original Prolok disk.

Prolok puts the casual copier—and even the deliberate pirate—out of business. It barely

PROLOK. SOFTWARE

Supercalc3 integrated with CAI package

JERICHO, N.Y. — Computer Associates International, Inc. (CAI) has announced the integration of its Supercalc3 spreadsheet as an option to run in the CA-Calc window of its CA-Executive integrated IBM Personal Computer software.

According to a spokesman for the company, the option gives CA-Executive users a more powerful spreadsheet as part of the integrated software package, which features a microcomputer-mainframe link. Supercalc3 includes CAI's Fastmath feature and supports the Intel Corp. 8087 and 80287 math processors. The maximum spreadsheet size is 9,999 rows by 127 columns, and it supports data bases of up to 9,998 records.

It also includes the Sideways feature, which allows users to print wide reports without cutting and pasting. Also featured is Supercalc3's sparse matrix memory manager.

The Supercalc3 Release 2 spreadsheet package is integrated within CA-Executive, allowing users to mark text within the spreadsheet and move it to any other CA-Executive components.

The Supercalc3 option to CA-Executive is priced at $175 per copy for one to nine copies, $150 for 10 to 99 copies and $125 for more than 100 copies. Computer Associates International is located at 125 Jericho Tnpk., Jericho, N.Y. 11753.

Gcos version introduced

WALTHAM, Mass. — Honeywell, Inc. has announced a new release of its Gcos 6 MOD 400 operating system for use on its Microsystem 6/20 and other DPS 6 series minicomputers.

Release 3.1 is said to support the C programming language. Program development software enhancements include a menu-oriented utility for the definition and administration of terminal forms, increased user registration and password protection safeguards.

Executive enhancements include accounting reports, an abbreviation command processor and improved support memory systems with a capacity of more than 2M bytes, the company said.

Other reported enhancements are systemwide accounting of resource utilization, a menu interface for user login and the ability to share up to 16M bytes of main memory among users.

Honeywell has also announced the Asynchronous Communications Facility, which reportedly gives users interactive access to teletype-compatible systems and allows users to tie into commercial data base services.

The office automation additions (OAS Release 3.0) include an 80,000-word spelling verifier and corrector, enhanced electronic mail capabilities, improved bisynchronous and IBM Systems Network Architecture-based communications and document transfer capabilities with IBM hosts and enhancements to Infocalc, Honeywell's electronic spreadsheet.

Primary license fee for the Microsystem 6/20 and DPS 6/40 system is $1,375; each additional license fee is $1,030. For the DPS 6/45, the end-user annual primary license fee is $2,500, and each secondary annual license fee is $1,875. Honeywell is located at 200 Smith St., Waltham, Mass. 02154.

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SOFTWARE & SERVICES

SYSTEMS SOFTWARE

LINKWARE CORP.
VAX:Information Server

Linkware Corp. has announced the VAX:Information Server software package for transferring information between personal computers and Digital Equipment Corp. VAX-11 superminicomputers running the VMS operating system.

The VAX:Information Server can be used to link IBM Personal Computers and compatibles running IBM's PC-DOS operating system, DEC Rainbows running Microsoft Corp.'s MS-DOS or Digital Research, Inc.'s CP/M-86 or Lee Data Corp. personal computers running MS-DOS.

The product is part of the Linkware:Information Service family of file servers that can be placed on each node within a multivendor networking environment. The product supports transfer of both text and binary sequential files.

The price for the VAX:Information Service is $12,000, and personal computer resident software costs $350 per copy for between one and 20 copies, the company said.

Linkware, 77 Rumford Ave., Waltham, Mass. 02154.

DAVIS, THOMAS & ASSOCIATES, INC.
CICS, Vsam packages

Davis, Thomas & Associates, Inc. has announced three packages for IBM's CICS and Vsam.

According to a spokesman, DTA/Vsam is a utility that was designed to back up, restore, reorganize or reset Vsam files. Critical information about each file backed up or restored is printed in a report, and files may be selectively restored from a backup tape. Backup tapes can be read by application programs either directly or through a provided subroutine. DTA/Vsam operates under IBM's DOS/VSE or OS/MVS and is priced at $1,200 for a one-year permanent license.

DTA/Print is said to be a productivity aid that allows quick access to reports on the host mainframe from remote locations. It is a report transmission system that makes it possible for remote users attached to an IBM CICS/VS network to both view and print reports stored on the host. Any report from any queue can be routed to any CICS-attached printer or viewed on any CRT, the vendor said. A one-year permanent license for the package is priced at $2,400.

DTA/Doc is said to be an on-line CICS utility that allows users to view the contents of an IBM DOS/VSE hard copy (console) file from any IBM 3270-type terminal connected to CICS/VS. DTA/Doc reportedly saves on console congestion, provides rapid answers to system operations questions, offers Help screens to define functions and program function keys and provides complete 3270 terminal support. A one-year permanent license fee is $600.

Davis, Thomas & Associates, Suite 301, 8800 Highway 7, Minneapolis, Minn. 55426.

DATAPOINT CORP.
Dosmerge

Datapoint Corp. has announced Dosmerge software that allows two separate versions of Datapoint's DOS to be merged in the Datapoint Attached Resource Computer (ARC) local-area network on Datapoint's 1560 series applications processors.

DOS.D — for processors based on Datapoint proprietary computers — and DOS.H — for computers based on commercial microprocessors — can be brought together into one network. DOS.H applications processors will have access to larger file servers and other services available through DOS.D.

Dosmerge has a first-time license fee of $1,500, which is waived if hardware is bought. The package is available at no charge to ARC system software subscribers.

Datapoint, 9725 Datapoint Drive, San Antonio, Texas 78284.

PENNINGTON SYSTEMS, INC.
SCRNIO/11 for RT-11

Pennington Systems, Inc. has announced that its screen form package is available for Digital Equipment Corp.'s RT-11 operating system on DEC's PDP-11 computers.

SCRNIO/11 is a subroutine library providing screen form, field attribute and video attribute capabilities for the applications programmer. Screen forms are developed and modified with an interactive form editor and can be disk- or memory-resident.

SCRNIO/11 for RT-11 is $1,500.

Pennington Systems, Building C, 65 S. Main St., Pennington, N.J. 08534.

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DATA from page 53

The determination of what is not agreed upon best begins with a discussion of what is agreed upon. It is generally agreed that a subject data base is the result of a data modeling or data analysis effort. Data analysis identifies such things as entities, attributes and keys. It is generally agreed that a subject data base is structured according to data, not applications. The old batch philosophy of creating one or more master files for every new application is the very antithesis of subject data bases.

It is generally agreed that subject data bases contain related data. The keys relate to the attributes and the attributes are all of the same general classification. Unrelated data is not found in the same subject data base. And it is generally agreed that subject data bases form a basis for a conceptual design of the data. At the physical or implementation level, there may be many variations of data base design, all based upon and conforming to the subject data base design.

Where are the areas of disagreement? At the moment of designing subject data bases, what rules are there to determine what data belongs in what subject data base? As a simple example, given two subject data bases — part number and supplier — does the number of parts supplied belong in the part subject data base or in the supplier subject data base? In both? In neither?

In any case, it is ambiguous where the attribute belongs. What would be useful are some rules or guidelines to determine the boundaries of a subject data base.

Guidelines for subject data bases

There are at least three intuitively appealing — and somewhat related — ways to create guidelines for the organization of data into subject data bases: by functional usage, by the natural relationship of data and around the fundamental entities of the corporation.

The major areas of functional usage are determined, either directly or indirectly, during the process of data modeling. For most corporations, the major areas of functional usage are fairly obvious. For example, in banking, the areas might be account activity, customer activity and fund/reserve activity. While these activities are distinct at a global level, as details are taken into account the distinctions tend to blur. Another shortcoming of division of data along major functional lines is that the data still tends to be organized along application lines.

The second notion for organizing subject data bases is along lines of a natural relationship of data. But this notion is inadequate, because taken in the abstract, there is no such thing as a natural data relationship. For example, consider the relationship between a person and a Social Security number. It can be argued that this is a natural relationship. But what if the system being built is for Social Security numbers that have not yet been assigned?

The relationship between data elements is formed by the context of usage, not by any mystical relationship. A third notion as to how data should be divided into subject data bases is by the fundamental entities of the corporation: While certain entities may be easily identifiable, what are the dividing lines between a major entity and a minor one? The discussion soon degenerates into one of ambiguity.

In practice, subject data bases have no rigorous rules for the inclusion or exclusion of data elements, despite the origin of rigorous methods of data and process modeling. The result is that in practice, judgment is the ultimate basis for deciding the boundaries of subject data bases.

But is the lack of rigor in the determination of what data does and does not belong in a subject data base really important? Ironically, in light of what purpose subject data bases ultimately serve, the lack of rigor is probably unimportant. Rigor is important only in the cases where subject data bases are frivolously defined around something other than the very broad, primary divisions of the corporation's data. In other words, if subject data bases are anywhere closely associated with the major data divisions of the corporation, then their exact contents are not terribly important.

Net result

This means there may be many different, valid combinations of what subject data bases should look like. At first glance, this result is surprising and intuitively unappealing, but only until the original purpose of building subject data bases is considered. The net result of data analysis and subject data bases is the minimization of the redundancy of data definitions. Once these are minimized, great benefits in development, maintenance and data synchronization are reaped.

As long as subject data bases are generally grouped around the primary entities of the corporation, then the benefits of subject data bases can be realized. This means that one arrangement of data may be just as effective as another; as long as redundancy of definition does not creep into the system.

Such a finding, however, does not diminish the importance of subject data bases.

Interestingly, subject data bases tend to be more easily defined for operational systems than for decision support systems. The importance and priorities of a company's operations are usually inarguable. The data that represents those systems is accordingly easy to set priorities for and to group. Decision support data, on the other hand, is not based on data that is easy to group.

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CW 10/22

AI from page 53

linear, predefined programming structure. In most cases, it draws on a knowledge base which, unlike a data base, contains data and rules for using it.

Paul Bassett, vice-president of Netron, Inc., a Toronto-based maker of computer-aided programming software for data processing, said a true AI system should be able to reach conclusions based upon incomplete or contradictory information. "What seems to be common to all efforts is coping to some degree with ambiguity," he said.

Dr. Larry Harris, president of Artificial Intelligence Corp., the Waltham, Mass.-based originators of the Intellect natural language query system, said the rules of an AI-based program differ markedly from the rules of a conventional program. "In a normal language where a statement is followed by another statement, there's an implicit assumption that one rule leads to the next one," he said.

"In a rule-based environment, there's no [chronological] association between one statement being required to execute the next one. It's simply a different way of instructing the machine."

Languages such as Lisp and Prolog were specifically designed for rule-based programming, although AI can technically be implemented in any language. A number of vendors are now selling technologies that can be used to develop expert systems. Some are even available for the IBM Personal Computer.

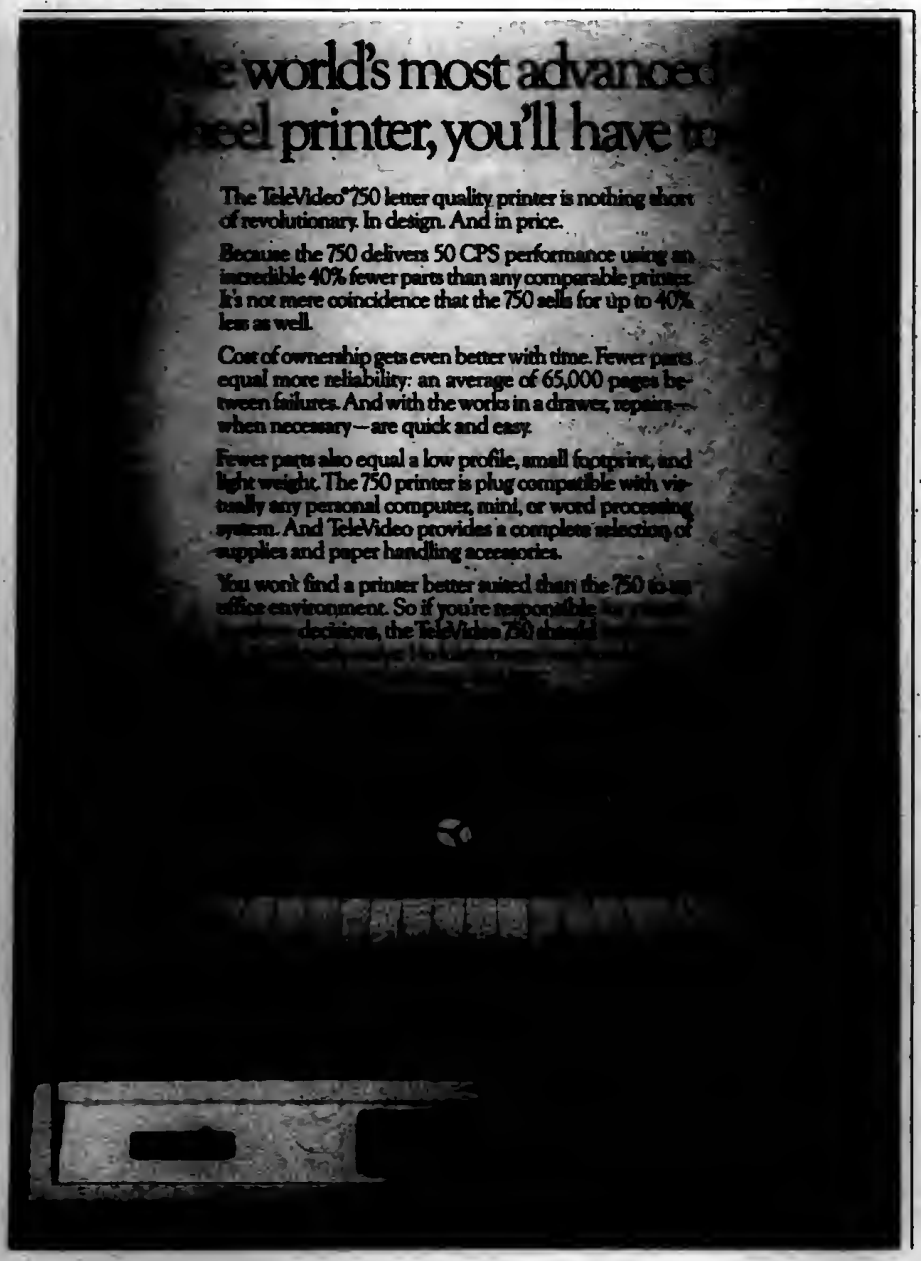
But the key word here is "develop." In most cases, AI cannot be retrofitted onto existing systems using traditional structured programming.

However, a lot of what is being passed off as AI software today consists mainly of conventional packages with some more sophisticated data base searching and matching routines tacked on. That doesn't mean these systems are bad — they simply aren't AI.

"I think [AI] will be one of the most abused terms in the business in short order," Harris said."There are relatively few commercialized AI products out there right now, although there are quite a few coming."

Companies such as Human Software Corp. and Mindware, Inc. may make an argument for having Personal Computer-based AI products. But while their offerings are certainly unique and interesting, they are rudimentary implementations of the technologies AI researchers perceive as true expert systems.

AI is on the brink of becoming commercially popular. But be wary of believing that something is AI-based just because the vendor says so. AI is still in the future. And no amount of marketing fanfare will overshadow the real thing when it comes along.



Is your system truly AI-based?

How do you tell if an artificial intelligence system really uses AI? It's not easy, but there are some basic guidelines you can use.

Paul Bassett, vice-president of Netron, Inc., a Toronto-based maker of computer-aided programming software for data processing, said there are two fundamental questions you can ask to determine whether a system is AI-based.

"You should ask, 'Under what circumstances can the machine be wrong,' " he said. "If the answer is 'never,' then you're probably being given a line."

However, if the vendor admits that the system can be wrong you should ask why, he said. "If it is because of the nature of the problem itself, then it might be AI," he said. "But if it's something the designers say they could improve upon, I'd say it's not." AI systems must be able to reach incorrect conclusions based upon their own knowledge base, he said. Problems should not be correctable by designing the system differently.

Dr. Larry Harris, president of Waltham, Mass.-based Artificial Intelligence Corp., developer of the AI-based Intellect natural language query system, outlined three features that must be present in knowledge-based systems and three for natural language query systems. He said knowledge-based systems should:

- **Address problems that were previously insolvable by computer.** Deciding which job applicant to hire may be a potential application but payroll is not.
- **Explain their actions.** Any knowledge-based system should be able to navigate back through its decision path and point out the factors that contributed to its conclusions.
- **Allow for direction from the user.** Users should be able to add temporary rules to the knowledge base interactively.

Natural language query systems, according to Harris, should:

- **Aim for fluency.** The systems should be committed to understanding a broad variety of wordings and should tolerate ambiguous words or phrases.
- **Support the user's conceptual view.** A person should be able to use the system without having to know anything about the underlying data structures.
- **Include readily invoked data manipulation capabilities.** Statistical and logical operations should not require a separate and more complex query language.

COMMUNICATIONS

AT&T, MCI executives discuss telecommunications landscape

By John Ott
CW Staff

McGowan

UNIONDALE, N.Y. — Although MCI Communications Corp. and AT&T often have trouble seeing eye-to-eye, both communications carriers at least agree that voice/data integration is a desired goal and a coming reality.

That was one fact gleaned from speeches made by Donald Procknow, vice-chairman of AT&T Technologies, and MCI Chairman William McGowan at the recent meeting here of the Communications Managers Association (CMA).

Addressing the association on consecutive days, the two speakers ruminated about their companies with regard to the state of the communications industry.

In his speech, Procknow said no one realized how complex divestiture was going to be and attributed today's private-line order and service problems to this oversight.

But not all of the divestiture energy, or what Procknow called "corporate fission," has been spent running in place. He said AT&T has introduced more new products and services in the last year than it has in the history of the company.

Procknow also used the forum to voice AT&T's opposition to continued regulation, claiming that "reality runs three fur-

See CMA page 80

BOCs seek FCC aid in face of growing bypass threat

By Phil Hirsch
CW Washington Bureau

Last month, several of the divested Bell operating companies submitted studies to the Federal Communications Commission that purport to show that bypass is growing rapidly. The reports' message was that if the commission does not come to the rescue, rates imposed on other customers will go through the roof.

In particular, the carriers want the FCC to slap a $4, or higher, monthly surcharge on each residential and single-line business telephone line. The FCC also wants to do this. Both argue that the increased revenue would permit multiline business users' rates to drop and thus would reduce the bypass threat to manageable proportions.

However, Congress, consumer groups and many state regulators vigorously oppose that idea. Early this year they "persuaded" the commission to defer the residential/single-line business user's surcharge.

The whole matter is going to come up again in December or early next year. If, as seems likely, the opponents have not changed their minds, the FCC is likely to look for a compromise; the commissioners, like most bureaucrats, value pragmatism far more than principle.

One possible alternative would be to let the divested Bell operating companies expand their present markets — Centrex, for example — and enter new ones — like packet-switched network services, thus providing additional revenue. That would allow reduction or possibly elimination of the proposed residential/single-line business surcharge.

At first glance, this solution seems to be perfect for corporate communications users: Message Toll Service/Wats rates are reduced because the operating companies' revenues from other sources are increased. Enhancements are added to Centrex, making this low-cost service even more cost-effective.

However, as pointed out by the International Communications Association (ICA), a major corporate communications users

See FCC page 78

■ AT&T Communications is seeking Federal Communications Commission approval to offer videoteleconferencing in Canada trhough its Accunet Reserved 1.5 service/76

■ Allnet Communications Services, Inc. recently announced average long distance rate reductions of 8%/76

■ Phoenix Microsystems, Inc. has released two communications test instruments and a matrix switch/78

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System enhances PBX, Centrex

By James Connolly
CW Staff

SUNNYVALE, Calif. — David Systems, Inc. has announced products that can be used to enhance existing analog private branch exchanges (PBX) and Centrex systems with data capabilities.

Together, the products compose what the company calls the Information Manager, which will be sold through the divested Bell operating companies and other distributors beginning in February.

The Information Manager is said to enable users that have older analog PBXs or Centrex voice services to use the twisted-pair wiring of these systems for data applications at speeds up to 2M bit/sec.

The major system component is the David Manager, a switch that forms the heart of the system. This switch sits between the PBX or Centrex system wiring block and David Sets, telephones that are available in three models ranging from a basic eight-function key set to an executive display set with 13 additional keys.

Reportedly, up to 64 David Managers

See DAVID page 78

DSU/CSU offered for Dataphone net

MANSFIELD, Mass. — Codex Corp. has announced the integrated 2132 Data Service Unit/Channel Service Unit (DSU/CSU) for direct connection to AT&T's Dataphone Digital Service (DDS) network. The 2132 DSU/CSU supports externally selectable synchronous data rates of 19.2K and 56K bit/sec and is a member of the Codex 2130 series.

With the addition of the 2132, the series now supports all operating speeds of DDS, the company said. The 2131 DSU/CSU, introduced earlier this year, is said to support data rates of 2,400, 4,800 and 9,600 bit/sec.

The 2131 and 2132 are available in stand-alone models and card versions. The 2130 series accepts most analog modem extensions.

The 2130 series is intended for use in both point-to-point and multipoint operating environments.

The single-unit price for the stand-alone 2132 is $1,095, and the 2132C card version costs $1,050, the company said.

Codex is located at 20 Cabot Blvd., Mansfield, Mass. 02048.

Nata's request to split Centrex could raise costs, reduce availability

WASHINGTON WIRE
Phil Hirsch

The North American Telecommunications Association (Nata) has asked the Federal Communications Commission for an order forcing Mountain Bell and Northwestern Bell Telephone Companies to change the way they market Centrex, or what they call Centron, services. The request poses an interesting question for users.

According to Nata, the two telephode carriers are now able to cross-subsidize Centron and gain an illegal advantage over independent private branch exchange (PBX) manufacturers, which make up much of the association's membership. A key point not emphasized in the petition is that the price of Centron services is substantially less than the price of equivalent PBX-based transmission services.

Presently, the association said, the two telephone companies are offering Centron services directly on a nontariff basis. This arrangement allegedly violates the FCC's Second Computer Inquiry decision, which allows divested Bell operating companies to offer enhanced services only through separate subsidiaries. According to Nata, Centron combines basic and enhanced features. The association wants the service split into two offerings: one provided directly by each carrier under a tariff and the other provided by its separate subsidiary on a nontariff basis.

The inevitable result of such a split would be making Centron more difficult to order and probably more expensive.

Even if Nata can show convincingly that Centron violates Computer Decision II, it may not be enough to win over the FCC's commissioners. Communications costs are going up faster than communications budgets in most companies, as was pointed out by four managers who spoke at Nata's recent annual convention in Washington, D.C. There is increased pressure to stretch dollars.

If the FCC wanted to help users in this area, it could issue a decision saying, in effect: "We know that Centron is an enhanced service, and under the Computer Decision II, the [divested Bell operating companies] have to market enhanced services through separate subsidiaries. But, as we made clear in that decision, our basic goal is to promote the availability of efficient, reasonably priced telecommunications services and equipment to customers. So in this case, we will disregard the separate subsidiary requirement."

Essentially, the FCC used this same logic last

See NATA page 80

COMMUNICATIONS

VOICE

DISTRIBUTED LOGIC CORP.
Optimux/16DMF+

Distributed Logic Corp. has announced its first communications product, an asynchronous controller designed to connect terminals, printers and other communications equipment to Digital Equipment Corp. Unibus-based computers.

The Optimux/16DMF+ is said to operate with DEC PDP-11 and VAX-11 systems, providing the capabilities of DEC's DMF32 and DH11 subsystems while permitting connection of 16 peripheral devices through a single backplane slot.

It reportedly offers software-selectable data transfer rates from 50 bit/sec to 34.8K bit/sec, and the selection of different transmit/receive rates for each of its 16 channels.

The controller features bidirectional data flow control that is said to virtually eliminate data loss in high transfer input applications and a multiword direct memory access burst mode that reduces Unibus overhead during output operations, the company said.

Available immediately, it costs $3,000.

Distributed Logic, 1555 South Sinclair, Anaheim, Calif. 92806.

T-BAR, INC.
CSM 3200 series

T-Bar, Inc. has announced its CSM 3200 series of computer matrix switches said to save floor space and use circuitry that reduces operating power by as much as 50%.

The CSM 3232 reportedly is IBM compatible and uses T-Bar's solid-state switching modules to provide higher density packaging and faster data through-path than previous T-Bar products.

The CSM 3202 is targeted at smaller applications and is expandable from two CPU channels by four switchable peripheral devices to an eight-by-eight or four-by-16 configuration.

The switches reportedly establish data transfer configurations among IBM-compatible mainframe channels and various peripheral controllers and allow data center managers to choose hardware configurations to suit changing tasks, applications or recovery modes.

The CSM 3232 is available in matrix sizes ranging from two-by-four to 32-by-32 at prices ranging from $39,000 to $788,000. The CSM 3202 is priced from $22,600 to $49,800.

T-Bar, 141 Danbury Road, Wilton, Conn. 06897

PROTOCOL CONVERTERS

KAUFMAN DATA COMMUNICATIONS, INC.
Series 8800

Kaufman Data Communications, Inc. has announced an Ascii-to-IBM Systems Network Architecture (SNA)/Synchronous Data Link Controller (SDLC) protocol converter.

Two models of the Series 8800 are available: the Model 8814 with six 19.2K bit/sec Ascii ports, expandable to 12 ports; and the Model 8830 with eight Ascii ports expandable to 28.

Both models have two SNA/SDLC ports and emulate IBM 3270 cluster controllers. Each port can reportedly support 32 logic units, enabling a single Ascii port to handle multiple devices, such as terminals with attached printers.

The units are said to be permanently programmed with protocols for 15 commonly used terminals, printers and personal computers and can be programmed by the user for other protocols.

Prices range from about $4,000 for the Model 8814 with six ports to about $10,000 for a 28-port Model 8830.

Kaufman Data Communications, 145 E. Dana St., Mountain View, Calif. 94041.

MULTIPLEXERS/ MODEMS

COMMUNICATIONS DEVICES, INC.
Modem Use Monitor
Model 01-10-0269

Communications Devices, Inc. has announced a device to monitor the use of up to 64 modems.

Called the Modem Use Monitor Model 01-10-0269, the device listens to the carrier detect lead of up to 64 modems and reportedly generates a graphics display of usage statistics on a dot matrix printer. That display is said to contain status data on each modem to help locate inoperative telephone lines and faulty modems.

The device was designed to help network planners add more facilities before the need becomes critical.

It costs $2,300.

Communications Devices, One Forstmann Court, Clifton, N.J. 07011.

LOCAL-AREA NETWORKS

INCYTE
Inplant

Incyte, a unit of the Schlumberger Ltd. CAS Division, has announced its Inplant local-area network. Inplant was designed for use primarily in factory automation applications where dissimilar devices must be connected to a Digital Equipment Corp. VAX-11 under DEC's VMS.

The network combines off-the-

Continued on page 74

What do top computer professionals usually say when we tell them about our unique, completely portable software?

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COMMUNICATIONS

Continued from page 72

shelf hardware from Ungermann-Bass, Inc. with Inplant proprietary software. It uses Ethernet, broadband and fiber-optic cabling.

Inplant is said to allow connection of more than 1,000 terminals and other devices to a VAX-11. The VAX-11's I/O processing is offloaded to the network's microprocessors, improving the host's performance by 15% or more, the vendor said. A basic configuration of 12 interconnections is priced at about $750 per port.

Incyte, 4 Main St., Los Altos, Calif. 94022.

DAVOX CORP.
Color workstations; file server

Davox Corp. has introduced four color workstations for its Davoxnet network, along with a file server that reportedly allows the IBM Personal Computer XT to act as the repository for all personal computer software in the network.

The workstations are said to offer low-profile keyboards and integrate voice and data. They reportedly can be linked in a Davox network either via coaxial cable in the 2900 series, or via twisted-pair wiring in the 3900 series.

Davoxnet reportedly integrates voice and data communications in a local-area network operating at 400K byte/sec using existing, twisted-pair wiring. It is compatible with nearly all existing private branch exchanges and will interface to all IBM mainframes, Davox said.

The file server reportedly allows users to request software and have the software loaded onto any personal computer in the network. Multiple users reportedly may request the same software and run it on distributed personal computers at the same time.

The file server is priced at $995. The workstations are priced as follows: Model 2911, $5,600; Model 2921, $5,700; Model 3911, $5,915; Model 3921, $6,015.

Davox, 4 Federal St., Billerica, Mass. 01821.

CYB SYSTEMS, INC.
Unite series

CYB Systems, Inc. has announced its Unite series of Unix network servers, designed to link Microsoft Corp. DOS-based personal computers.

The servers are said to let users run applications on their personal computers' DOS or log on to Unite as a terminal and use the system processor to run Unix applications.

Running under AT&T's Unix System V, the Unite series includes five models based on Motorola, Inc. MC68000 microprocessors and using the Intel Corp. Multibus.

A Unite-based network can accommodate up to 32 personal computers, or up to 1,024 with an Ethernet option. A personal computer needs a serial I/O port and 192K bytes of random-access memory (RAM). Communications speeds are 9.6K bit/sec using twisted-pair wire and 10M bit/sec using Ethernet.

While operating under DOS, micros reportedly can send mail to other Unite-networked computers, post messages on a bulletin board or spool print requests. Under Unix, users reportedly can read and edit data files created under DOS or use eight options from a windowed screen menu.

The Unite series models are the Unite 1i, which holds up to 1.5M bytes of RAM and 40M bytes of disk storage, supports one personal computer and costs $8,995; the Unite 4i, which can be similarly configured for four users at $9,995; the Unite 8i with up to 2.5M bytes of RAM and 106M bytes of disk storage for eight users at $16,995; the Unite 16i with up to 4.5M bytes of RAM and 168M bytes of disk storage for 16 users at $24,445; and the Unite 32i, which offers 8.5M bytes of RAM and 1.86G bytes of disk storage for 16 users at $49,995 and 32 users at $53,995.

CYB, 6448 Highway 290 E., D-111, Austin, Texas 78723.

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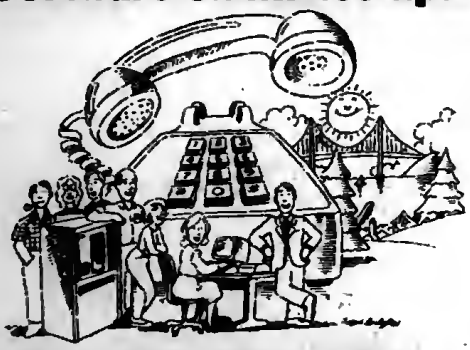

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Automated Systems, Inc. has announced a modem designed for use in Megalink Communication Control Systems, Computrol's industrial and commercial local-area network.

Modem M-1, which measures 2 by 2¼ inches, can be used with IEEE 802.4-compatible token-passing bus networks and provides two-way transmission of asynchronous data over coaxial cable at data rates of up to 2M bit/sec over 50,000 feet, according to the company.

It costs $85.

Computrol, 15 Ethan Allen Highway, Ridgefield, Conn. 06877.

NETWORK SERVICES

AT&T COMMUNICATIONS
Accunet Reserved 1.5

AT&T Communications announced that it has filed a proposal with the Federal Communications Commission to make videoteleconferencing available to points in Canada through AT&T's Accunet Reserved 1.5 service.

AT&T has proposed making the videoteleconferencing available via a major border crossing point in Buffalo, N.Y. AT&T said that Telecom Canada, an association of nine Canadian telephone companies and Telesat Canada, has announced plans to develop a cross-border videoteleconferencing service to link up with AT&T facilities.

The service will reportedly enable U.S. customers to originate videoteleconferencing calls to Canada from 23 cities served by Accunet.

Prices will vary depending on use. By current rates, for example, a one-hour call from Chicago to Montreal would cost $472, AT&T said.

AT&T Communications, 295 N. Maple Ave., Basking Ridge, N.J. 07920.

ALLNET COMMUNICATION SERVICES, INC.
Long-distance rate reductions

Allnet Communications Services, Inc. announced it has reduced its long-distance telephone rates an average of 8%, effective Sept. 1.

The alternative long-distance carrier also announced revisions in its discount categories, a move it said will make it easier for users to earn discounts based on monthly usage volume. The qualifying minimum for the volume discount schedule has been lowered from $25 to $20. Allnet subscribers can now earn discounts ranging from 2% to 12% based on volume usage.

Allnet Communication Services, 100 S. Wacker Drive, Chicago, Ill. 60606.

KORSMEYER ELECTRONIC DESIGN, INC.
The Solution

Korsmeyer Electronic Design, Inc. has announced an AT&T Unix III-based time-sharing service that allows subscribers to utilize Unix by modem from more than 300 cities. The Solution can be accessed via GTE Telenet Communications Corp.'s Telenet, according to Korsmeyer Electronic Design.

It is said to supply programming languages and to ease design of languages.

System highlights reportedly include Unify, a data base system, on-line Unix manuals and Usenet, a networked bulletin board updated with 170 articles per day and consisting of more than 190 categories with postings from more than 850 Unix sites.

Fees start at $2.95/hour plus 5 cents per CPU second from 6 p.m. to 6 a.m. weekdays and all day weekends and holidays. The minimum monthly usage charge is $10, and there is no surcharge for 1,200 bit/sec access.

Korsmeyer Electronic Design, 5701 Prescott Ave., Lincoln, Neb. 68506.

RCA GLOBAL COMMUNICATIONS, INC.
RCA Mail

A fully integrated electronic mail service for intraoffice use has been introduced by RCA Global Communications, Inc.

RCA Mail is part of an electronic message service with access to RCA Globcom's domestic and international telex network. It is designed to work with asynchronous terminals using a 300 to 1,200 bit/sec modem.

Organizations using the system pay a $140 monthly subscription fee, 5 cents for every 1,000 characters transmitted

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Working together, Honeywell and the Veterans Administration have built one of the largest computer systems in America. And one of the most appreciated.

The system is called TARGET, and this year alone it will help to disburse some 14 billion dollars in benefits to more than 30 million veterans and their families.

There's more to TARGET than sheer magnitude, however. There's performance. This system was specifically designed to provide fast and uncomplicated service—and that's just what it does. The VA is one government agency that runs like clockwork.

3000 terminals, no waiting

On-line access means instant control of 15 million records. Retrieval is so quick that a file stored in Chicago can be on a CRT in Miami faster than a claims developer could pull it from a stack on his desk.

This speed enables the VA to serve a veteran from whatever office he walks into. Questions that once took weeks to answer can now be resolved in minutes.

Naturally, the dispatch and efficiency with which veterans receive their benefits has increased sharply. And here's another benefit: American taxpayers are saving a bundle.

Together we found the answer

The development of TARGET is a good example of Honeywell/customer teamwork.

Honeywell provided four large-scale host computers, 100 small computers, 3000 terminals, and 800 printers. As well as the communications needed to tie them all together across 57 cities.

The VA wrote the software.

What emerged is a system that routinely processes 200,000 complex transactions a day. A system that offers access to any file through any terminal. A system that makes a giant job look easy.

It's amazing what you can do when you work together.

For information on how a Honeywell computer network can work for you, call 800-328-5111, ext. 2722. (In Minnesota call collect 612-870-2142, ext. 2722). Or write Honeywell, Information Systems Division, 200 Smith Street (MS 440), Waltham, MA 02154.

Together, we can find the answers.

Honeywell

COMMUNICATIONS

Continued from page 75
mitted and from $4/hour to $14/hour for usage time. According to the company, after three months, there is a minimum usage fee of $500.

RCA Global Communications, 60 Broad St., New York, N.Y., 10004.

TEST EQUIPMENT

PHOENIX MICROSYSTEMS, INC.
Model 1500; Model 5500; Model 3250

Phoenix Microsystems, Inc. has announced two communications test devices and a matrix switch, all of which are said to feature data interface flexibility as well as remote control.

The Model 1500 portable test set reportedly has bit error-rate testing, trap and polling capabilities at up to 112K bit/sec and the ability to simulate data communications equipment, such as modems, or data terminal equipment.

It comes with standard RS-232 support and optional modules to support CCITT V.35, RS-449 and other standards. It costs $1,995 and is available now.

The Model 5500 is said to be a high-speed bit error-rate test and phase jitter test set for checking lines operating between 50 bit/sec and 13M bit/sec, including T1 and T1C systems.

Standard interfaces are the RS-232 and IEEE-488; optional modular interfaces include V.35, RS-449, T1/T1C and T1 Framed. Available now, it costs $5,995.

The Model 3250 is a transparent, nonblocking matrix switch designed to connect up to 16 RS-232, V.35, RS-449 or other interfaces. It reportedly supports up to 112K bit/sec per port and allows any terminal connected to any port to communicate with the other 15 terminals.

It will be available in late October at a base price of approximately $2,500 with the standard RS-232 support.

Modules will be available for the other interfaces.

Phoenix Microsystems, P.O. Box 4206, Huntsville, Ala. 35802.

RACAL-MILGO, INC.
Communications Management Series TCM-7

Racal-Milgo, Inc. has announced test control modules that are said to provide installed modems with diagnostic capabilities.

The Communications Management Series (CMS) TCM-7 reportedly was designed to provide greater network control in the wake of the AT&T divestiture.

It electrically surrounds modems to provide performance and alarm information to central site operators and to give users centralized control to detect and diagnose problems at remote sites, according to a vendor spokesman.

The CMS TCM-7 reportedly can be installed with existing modems in single-vendor or multivendor networks operating at 1,200 to 16.8K bit/sec and can be used in either point-to-point or multidrop configurations.

Scheduled to be available this month, it costs $850, according to the vendor spokesman.

Racal-Milgo, 8600 N.W. 41st St., Miami, Fla. 33166.

FCC from page 71

group, there is a dark side to this bright picture.

ICA was talking about the effects of allowing the divested Bell operating companies to provide end-to-end protocol conversion, but its remarks apply equally to letting those same carriers offer enhanced Centrex directly, at rates capable of being surreptitiously cross-subsidized.

"Such practices would result in such a large cost advantage to the [divested Bell operating companies] that alternative suppliers of enhanced services would be forced out of the marketplace," ICA reported. "Not only would service diversity suffer, but the [divested operating companies] ultimately would be able to exercise their monopoly power to raise . . . rates to an unjustified level."

DAVID from page 71

can be interconnected to provide a range of 48 to 8,000 nonblocking ports. Each device contains an Intel Corp. 80186 processor and up to 20 interface cards providing links to the Centrex or PBX system and to the digital telephone sets. Each interface card can support 24 lines, David Systems said.

Data devices can be attached to the system through RS-232 interfaces on the David Sets. The link between the manager and the telephones, dubbed the David Link, is said to operate at 2M bit/sec, providing simultaneous voice, circuit-switched data and packet-switched data. The link is achieved over a single twisted-pair telephone wire at distances up to 2,000 feet.

The Information Manager is available in voice only (for a user that wants to upgrade for electronic telephone functions), data only and voice/data configurations.

According to the vendor, the products can be configured as a local-area network using Ethernet device adapters.

David Systems said suggested pricing, which is dependent on the desired features, is $600 to $800 per station for data only and $1,000 to $1,400 for voice and data. An entry-level voice/data system for 48 users is expected to cost approximately $48,000.

David Systems is located at 701 E. Evelyn Ave., Sunnyvale, Calif. 94086.

Making multi-vendor office systems work together requires just one thing.

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The idea seems simple enough: connect all of your office systems so that documents can be freely interchanged for editing, storage, display, and printing. That includes word processors, PCs running word processing packages, and mainframe terminals accessing DCF and PROFS.

Many vendors claim to connect multiple vendors' equipment through "protocol translation." And connect they can, but not communicate. To really communicate requires transforming the document coding so that it is fully editable at the receiving system.

Soft-Switch is compatibility

ITI's Soft-Switch is a program product for your IBM mainframe (MVS or VM) that allows users to send documents to other users with document translation performed automatically, to store documents in host libraries, and to retrieve documents from these libraries.

Soft-Switch communicates with IBM, Wang, Xerox, and NBI. It communicates with the MultiMate word processing program on the IBM PC, with DCF and with PROFS; with the IBM 6670 laser printer, and with standard hard copy printers.

Soft-Switch is totally consistent with evolving standards for office systems. In fact, Soft-Switch integrates multi-vendor office environments by first translating a document into IBM's level 3 Document Content Architecture (DCA), and then into the exact format required by the receiving workstation.

Soft-Switch solves today's problems

Let's say an analyst prepares a document on his PC with MultiMate. He executes Soft-Switch (which executes in the PC, as well as in the IBM host) and specifies distribution to his secretary's Wang word processor and to the 6670 laser printer down the hall. Soft-Switch provides the micro/mainframe link, transports the document from the PC to the IBM host, translates the document from MultiMate format to DCA, translates the DCA format to Wang's WPS format and the IBM 6670 laser printer OCL format, and routes the documents to their final destinations.

Soft-Switch: a path to tomorrow

Already installed at many FORTUNE 100 companies, Soft-Switch integrates the technologies of protocol translators, text management systems, micro/mainframe links, message switches, and electronic mail systems to provide organizations with integrated office systems.

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CMA from page 71

longs ahead of regulatory policy." In particular, the vice-chairman said, the separate subsidiary requirement of the Federal Communications Commission's Second Computer Inquiry cannot be tolerated. Calling it selective regulation, Procknow said the ruling — that AT&T must maintain a separate subsidiary to sell nonregulated equipment to end users (which AT&T Information Systems does) — was conceived to counter threats that no longer exist.

Technology is more important than regulation to the communications industry, Procknow acknowledged. He broke the field down into three major areas:

- Light-wave technology — which he said is still a precocious infant, but one where new developments are occurring very rapidly.
- Microelectronics — an older technology where progress has slowed but still moving forward, as in the case of the 1M-byte memory chip, said to be almost ready to come out of the laboratories. Procknow noted that Ian Ross, president of Bell Laboratories, thinks a 100M-byte chip is feasible.
- Software technology, which Procknow said is still "complicated and cumbersome" and lagging behind the other two technologies in terms of development.

While the technologies outlined by Procknow are mostly the same for telecommunications and data processing, there is an overtendency to use the similarities as a common denominator in a comparison of the two industries, MCI's McGowan said in his opening remarks. "It is unreasonable to expect the kind of economic price decreases [realized in data processing] to carry over to telecommunications."

There will be cost reductions here and there, McGowan said, but the "real story is not going to be how little these services cost, but how much value they provide."

That value will have many measures. One will be voice/data integration over T1, 1.54M bit/sec digital facilities, McGowan said. Today, voice can be reliably digitized at 32K bit/sec. In two years, McGowan said, 16K bit/sec will be possible, enabling more than 90 voice channels to be squeezed onto a single T1 link.

Another major measure of a service's value will be what McGowan called virtual private networks. These networks will make it possible to manage an integrated voice/data network simply, he said.

MCI reportedly will begin using a virtual private network internally next year [CW, Sept. 24].

Noting that provision of these services is expensive, McGowan predicted that, of the roughly 400 companies providing services today, only a handful will remain in the 1990s.

The oft-mentioned service glut, which, in theory, could arise if all of the companies that have planned fiber-optic networks actually install them, will never come about, McGowan contended, because self-correcting market forces will dry up their financing.

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NATA from page 71

year when it decided that although the Computer Decision II separation rules would apply to the divested Bell operating companies, a wire line carrier and its separate subsidiary could set up joint billing, installation and maintenance systems, and the former could refer customers to the latter.

Extending this logic to Centrex services would affect a large number of users. In addition to Mountain Bell and Northwestern Bell, Nata has accused Pacific Bell, Illinois Bell, New Jersey Bell and Wisconsin Bell Telephone Cos. of marketing enhanced Centrex services directly.

The underlying issue of whether Computer Decision II should be modified so users can save money has also cropped up in other pending FCC proceedings that question whether divested Bell operating companies should be allowed to offer end-to-end protocol conversion as part of a basic packet-network service.

At the moment, the FCC seems to want to diminish the bright line between regulated and unregulated services wherever it considers competition sufficient to keep the beneficiaries honest.

In July, the commissioners allowed AT&T's deregulated subsidiary, AT&T Information Systems, to obtain basic services from AT&T Communications and then combine them with AT&T Information Systems' own enhanced services.

But the former Bell operating companies were forced to accept far less: Their subsidiaries could obtain basic services on behalf of specific customers, but these services could not be modified or bundled with any of the subsidiary's own offerings.

The FCC decided to treat the divested Bell operating companies differently from AT&T because it believes that the long-distance market is more competitive than the local exchange market.

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SYSTEMS & PERIPHERALS

HARD TALK
Tom Henkel
CW News Editor

Still dying after all these years?

The longest running death scene in history may, once again, be headed for its final wheeze. Control Data Corp.'s recent bailout from the IBM-compatible peripheral business and Storage Technology Corp.'s anticipated $20 million third-quarter loss have renewed speculation that the IBM-compatible hardware business is about to breathe its last.

But before sending a wreath to mourn the late plug-compatible manufacturer (PCM) business, remember that tales of impending doom have been circulating for at least five years now. In fact, the saga of the PCMs reads more like an episode from a 1930s cliffhanger than a chapter from high-tech folklore.

The tale dates back to 1979 [CW, Oct. 1, 1979] when financially troubled Itel Corp. dumped its IBM-compatible processor business into National Semiconductor Corp.'s lap. At the time, some said the PCM companies had one foot on the proverbial banana peel, but Hitachi, Ltd. thought differently. It was looking for an avenue to sell its complete systems, not just components, in the U.S. And the Intel deal seemed to fit those desires.

Somewhere between late 1981 and early 1982, CDC made its first quick exit from the IBM-compatible business when, without fanfare, it stopped offering its Omega line of 4300-compatible processors. CDC never formally announced that the Omega was dead; the subject came up in passing one day during a conversation with a CDC executive. The fact that CDC stopped marketing the Omega did not really shock anyone. The system was never a hot seller, and at the time of its demise, CDC admitted that it only offered the mainframes as a way of selling peripherals anyway. In fact, CDC never actually made the Omega machines, they were purchased on an OEM basis from what was then a start-up company, IPL Systems, Inc. A few weeks ago, following

See PCM page 89

Tandem presents workstations said to combine micro, terminal

By Jeffry Beeler
CW West Coast Bureau

CUPERTINO, Calif. — Tandem Computers, Inc. recently complemented its line of transaction-processing-oriented mainframes with its first two workstations. The two units reportedly combine an IBM-compatible microcomputer with the ability to communicate both with Tandem and IBM hosts.

Tandem's 6540 series of personal workstations comes with two communications software packages that purportedly reformat mainframe data base files into an IBM Personal Computer-useable form and allow files to be exchanged between host CPUs and micros.

PC Format, the reformatting package, and Information Xchange Facility form part of the same product announcement as the two 6540 series workstations. Also included in the announcement are two 158 char./sec dot matrix printers that provide the workstations with local output and double as a shared resource for Tandem mainframes.

Although the 6540 machines differ substantially in size and performance from any Tandem processor that has preceded them, the company claims the workstations in no way mark a departure from the company's existing product and business strategy. Like the rest of the firm's offer-

See TANDEM page 88

DEC unleashes laser printer for graphics

MAYNARD, Mass. — Digital Equipment Corp. announced its first laser printers said to be designed for high-resolution graphics applications requiring variable font capabilities.

Called the LN01B and the LN01S, the printers are targeted toward computer-aided design and business graphics applications markets. These include manufacturing and engineering firms, government agencies and research laboratories, DEC said.

The LN01B features 16 resident labeling fonts and support of DEC's Remote Graphics Instruction Set and California Computer Products, Inc. plotter-type graphics. It enables users to print out a page of plot-quality images at speeds of 12 page/min, the company said. A DEC software package called Plotin, which runs on DEC's VAX/VMS operating system, provides the LN01B with graphics functions.

The LN01S has 12 resident text fonts in four weights and supports the Tektronix, Inc. 4010 and 4014 graphics protocols, the company said. The LN01S is said to have full bit-map capability via an external con-

See PRINTERS page 86

Burroughs' Prograph hits market

DETROIT — Burroughs Corp. has announced the Prograph GP 2000, a graphics system featuring the company's 48-bit display processor. The unit can accommodate up to 2.2M bytes of random-access memory and one or two 160M-byte disk drives.

Software is available for graph, map, document, font and symbol creation, as well as picture storage and retrieval, the company said. The Prograph can accommodate a variety of I/O devices including digitizing tablets, plotters, ink-jet printers and 35mm film recorders.

The system includes a software processing unit, a peripheral processing unit, disk processor, I/O port module, main memory, 160M-byte disk drive, power supplies, cooling fans and an operator readout panel. Required peripherals include an operator console and a Burroughs 9498 streaming tape drive. The company's GP 300 color display system, a channel processor and a digitizing tablet are also available.

The GP 2000 system starts at $70,000.

Burroughs is located at 1 Burroughs Place, Detroit, Mich. 48232.

■ Dataproducts Corp. announced eight printers, including a 24 page/min laser xerographic unit/82

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Report finds survival of fittest persists for disk storage start-ups

By John Desmond
CW Staff

NORWALK, Conn. — The optical and magnetic disk computer storage business is experiencing an unusual flood of new entrants, and not all of them will survive in the increasingly competitive market, according to a recently released report from International Resource Development, Inc. (IRD) here, a market research and consulting firm.

Most of the start-up firms are targeting areas of new development, such as thin-film rigid disks and perpendicular recording — in which particles are aligned in perpendicular fashion to fit more bits on the disk — for floppy and rigid disks. IRD claimed nearly one-third of some 30 companies in the thin-film disk business are independent firms established specifically to produce that medium.

A number of these companies lack sufficient financing, and the report predicted many will either go out of business or be acquired in the next several years. Some companies do attract financing, such as Applied Information Memories, a thin-film disk manufacturer that received nearly $20 million from investors including General Electric Co., the report said.

IRD analyst Joan de Regt predicted the companies that do survive will make it big because some established disk suppliers are ignoring the direction of the market and allowing young companies to carve out a share.

The report is critical of Dysan Corp., a leading supplier of rigid disks, for not pursuing the manufacture of thin-film disks. The report stated the company is not convinced of the disk's reliability when manufactured in high volumes, and Dysan management maintained that improvements will occur in oxide disks to close the price/performance gap with thin-film disks. Disagreeing with Dysan management, the report stated, "This stance . . . is becoming less tenable as each day goes by, and more and more drive manufacturers are using thin-film disks." The report predicted that Dysan will be forced to enter the market late.

IRD further predicted that thin-film disks will make up 18% of the total U.S. market for rigid disks this year and that the share will expand to 84% in five years. Among reasons cited for the growth is the surge in demand for the 5¼-in. and under drives, which the report said are prime candidates for higher density and more durable thin-film disks. This segment's share of the total market is projected to increase from one-third in 1984 to one-half by 1989 and two-thirds by 1994.

See IRD page 88

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The only specialized computer publication written exclusively for the People's Republic of China (PRC).

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China Computerworld is a joint venture of the Ministry of Electronics and Computers and CW Communications/Inc. It has a total paid circulation of 38,000. An additional 50,000 copies are distributed throughout all provinces in the PRC and pass-along readership is over 500,000. *China Computerworld* readers include the key government officials and computer managers who have EDP purchase decision authority.

China Computerworld is a newspaper published twice a month on the eighth and the twenty-third. Its tabloid format and pertinent editorial offers you a unique vehicle in which to introduce your products and services.

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Xerox subs price-cut IBM 4331 in system

NEW YORK — Xerox Computer Services, a division of Xerox Corp., said it plans to take advantage of IBM's recent price cuts on its 4300 mainframe series. Xerox said the IBM 4331 with 2M bytes of main memory is being substituted for the IBM 4321 with 1M byte of main memory in the Xerox/IBM 4300 Turnkey System package.

A spokesman for Xerox also said when the 4331 goes out of production at the end of the year, Xerox will try to substitute IBM's 4361 Model 3, the recently announced low-end model of the line. But the cost of making that substitution has not yet been determined, said Product Manager William Weigle.

While the memory and throughput of the Xerox Model 4331-J2 has been doubled, the price is the same as the price of the 4321 — $250,000, Xerox said.

More information is available from Xerox Computer Services, 5310 Beethoven St., Los Angeles, Calif. 90066.

Dataproducts releases include laser printer

NEW YORK — Dataproducts Corp. has announced eight printers, including a 24-page/min xerographic laser printer, three daisywheel printers and four dot matrix printers.

The three daisywheel printers are the DP-20, DP-55Q and DP-55SQ. The DP-20 prints at 20 char./sec and operates at less than 55db. Both the DP-55Q and the DP-55SQ print at 55 char./sec, the DP-55SQ operates at less than 55db and the DP-55Q runs at less than 60db, the company said.

The DP-55Q and DP-55QS have a 6,000-hour mean time between failure rate, while the DP-20 is rated at 2,500 hours, the company said. Each employs a 132-col. print mechanism and the company's single-action print hammer. The DP-Series printers are available with a Centronics Data Computer Corp. interface, making them compatible with the IBM Personal Computer and its compatibles, the company said. The price of the DP-20 is $799; the DP-55Q, $2,195; and the DP-55SQ, $2,395, according to the vendor.

The four dot matrix printers are the 8011, 8021, 8051 and 8071. The 8011 and 8021 are monochrome printers and the 8051 and 8071 offer color graphics capabilities. The 8011 is an 80-col. printer, while the 8021 prints 132 columns. Each prints 180 char./sec in draft mode, 90 char./sec in text mode and 30 char./sec in near-letter-quality mode, the company said. The price for the 8011 is $649, and the 8021 costs $849, the company said.

The 8051 and 8071 are 132-col. full-color printers. The 8051 prints at 200 char./sec in draft mode, 110 char./sec in text mode and 35 char./sec in near-letter-quality mode. The 8071 is rated at 400 char./sec in draft mode, 200 char./sec in text mode and 75 char./sec in near-letter-quality mode, the company said. The price of the 8051 is $1,895, and the 8071 costs $2,395.

The NP24 employs solid-state laser imaging technology and prints at 24 page/min and at a resolution of 300 dot/in. in page formats up to 11 by 17 in., the company said. The price of the NP24 with line printer emulation is $11,495, the company said.

The CP40 check printer can produce magnetic ink character recognition (Micr) code as well as alphanumeric text with its dual plastic print wheel. The CP40 prints from 8 to 15 char./in. At 12 char./in., the CP40 prints at a speed of 55 char./sec, the company said. If printing Micr only, the CP40 will print 30 check/min. At 8 char./in., the CP40 will print 15 check/min, the company said. The price of the CP40 is $2,475.

More information can be obtained from Dataproducts, P.O. Box 746, 6200 Canoga Ave., Woodland Hills, Calif. 91365.

Q. First of all, just what is a cabling system?

A. A cabling system is designed on a "wire once" concept. Just as electrical wires are run in buildings today, a cabling system is a permanently installed set of wires that connects the computers, terminals, workstations, telephones and PBXs within a large office building or a campus. This cabling system should also be the foundation for local area networks of the future.

Q. Aren't my computers and telephones already hooked up to a cabling system?

A. It's not so much a cabling system as it is a bunch of cables. Look above the drop ceilings in most office buildings, and you'll discover miles and miles of all kinds of cable. And much of it, strangely enough, is unused. The reason for this waste is that few devices (i.e., telephone, terminal, personal computer, etc.) use the same type of cable. Consequently, when a new device is installed or when one is moved from one office to another, it's quicker, easier and cheaper to run a new cable than it is to remove and rewire the old cable.

This is not to suggest, however, that running a new cable is quick, easy or inexpensive. Relocating just one terminal can cost as much as $1,500. Not to mention a week or two of downtime while the wiring gets done. And when you think about how often office workers move from one workplace to another, you can see that we're talking about a considerable expense.

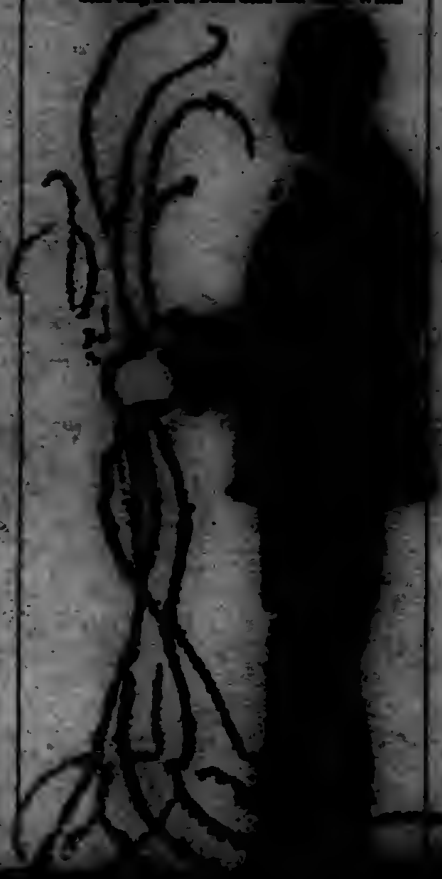
Q. How can a cabling system help solve my wiring problems?

A. Once installed, a cabling system can make wiring for a new or relocated terminal as easy as moving a plug from one socket to another. The IBM Cabling System calls for the one-time installation of a single cable running from each workplace, inside the walls, and into a central "wiring closet." In the office, that cable terminates in a standard faceplate on the wall, not unlike an electrical outlet. In the wiring closet, the cable terminates in a patch panel that can connect to any number of devices.

The installation of the IBM Cabling System should be considered if you're adding a number of new workstations, installing a PBX, doing a major renovation or building a new office building. In many cases the "wire once" benefit will most justify the IBM Cabling System in five years.

Q. How do the telephones and the IBM Cabling System work together?

A. The IBM Cabling System can be used for data only, or for both data and voice. When



Q. [illegible] Cabling System.

A. Currently [illegible] in office buildings, the IBM Cabling System can connect most of the available IBM data devices, such as personal computers, workstations, small and intermediate computers. We expect that it will also connect many devices made by other manufacturers.

Q. How will the Cabling System help manage my telecommunications needs of the future?

A. The quality and reliability of the IBM Cabling System enable it to transmit data at very high speeds. This makes it the ideal foundation for IBM's planned general purpose local area network (LAN). This LAN, utilizing a "token-ring" technology, can be implemented gradually to connect different workstations, departmental systems and large processors. So by investing in the IBM Cabling System today, you'll not only save money on current installation and rewiring costs, you'll also be better prepared to meet your telecommunications needs of the future.

Q. How do I go about getting the IBM Cabling System?

A. There are a number of design and installation companies that can plan your cabling system and do the actual wiring. The cable and accessories are available through authorized distributors. Your IBM marketing representative can provide you with the names of these companies. The cable and accessories can also be ordered directly from IBM.

Q. Where do I go from here?

A. Installing the IBM Cabling System today is really installing the foundation for your company's future in telecommunications. So you'll want to plan quite thoughtfully. We can help. If you'd like a free copy of the brochure, "The IBM Cabling System," call 1 800 IBM-2468, Ext. 90, or return the coupon.

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SYSTEMS & PERIPHERALS

PROCESSORS

DYNAGE/CONTROLS, INC.
Safe 8000 Basic Programmable I/O System

Dynage/Controls, Inc. has announced the Safe 8000 Basic Programmable I/O System, said to replace programmable controllers, proportional integrating derivative controllers and data loggers while providing greater versatility.

The unit reportedly can be used as a local stand-alone process control computer system or as a remote front-end for distributed control and/or data acquisition. The subsystem can communicate to a host over two RS-232 or RS-422 ports.

The Safe 8000 is programmed in Safe Basic and provides 64 control algorithms, software timers, priority interrupts and multitasking, the company said. Applications include setpoint control, data acquisition, batching control and sequential control. The Safe 8000 communicates in standard Ascii and will interface with any terminal or computer system that has a serial port. It can also communicate over telephone lines for remote data acquisition applications, the company said.

The Safe 8000 supports up to 128 analog channels and 2,048 discrete signals. A variety of I/O modules are available to enable interfacing to most industrial signals, including relays, 115 Vac outputs, frequency and pulse inputs and thermocouple inputs, the company said.

Safe 8000 prices start at $3,767.

Dynage/Controls, 2 Willowbrook Road, Cromwell, Conn. 06416.

DATA STORAGE

DATAPOINT CORP.
9317 disk drive

Datapoint Corp. has announced a disk drive designed to perform file service functions for processors using the firm's DOS Arc local-area network.

The Datapoint 9317 Winchester disk drive provides 20M bytes of online data storage for Datapoint 1560 computer systems.

The desktop 9317 can be expanded via extension modules as storage demands grow, the vendor said.

The price of the Datapoint 9317 disk drive is $7,495, according to the vendor.

Datapoint, 9725 Datapoint Drive, San Antonio, Texas 78284.

PRINTERS/PLOTTERS

FACIT, INC.
80-col. printer, 4528 family

Facit, Inc. has announced an 80-col. printer in the 4528 family of microprocessor-controller printers, previously available for 136-col. printing only.

The 4528 printers are available in three versions: the 4528D demand document version for ticketing, bar codes and labeling, the 4528T for standard text-printing applications and the 4528V for bar code and label printing.

The prices for the 80-col. model of the 4528 are $1,345 for the 4528T, $1,545 for the 4528V and $1,700 for the 4528D, the company said.

Facit, 9 Executive Drive, Merrimack, N.H. 03054.

DICONIX, INC.
Dijit 1 ink-jet printer

Diconix, Inc., a subsidiary of Eastman Kodak Co., has announced the Dijit 1 ink-jet printer, said to combine graphics and text at resolutions of 300 dot/in. and speeds of up to 18 page/min.

Standard features of the Dijit 1 include 128K bytes of random-access memory, multipurpose font set, automatic two-sided printing, Centronics Data Computer Corp. interface and Xerox Corp. 2700 emulation. Other features are 500 sheet I/O bin capacity and self-test and operator diagnostics.

The printer has two operating modes. The quality mode prints at a resolution of 300 by 300 dot/in. for letter-quality output. The second mode prints at higher speeds of up to 18 page/min. for draft-quality printing, the company said.

Typefaces are available in Roman and italic styles and medium and bold weights. Type sizes ranging from four to 36 points can be combined within any document, the company said. The Dijit 1 employs the company's own multiple array ink-jet technology, featuring a print bar perforated with an array of microscopic holes through which millions of ink droplets per second pass.

Prices for the Dijit 1 range from $5,000 to $7,500. Delivery is scheduled for the first quarter of 1985.

Diconix, 3800 Space Drive, Dayton, Ohio 45431.

LASERGRAPHICS, INC.
UI-100 printer rasterizer options

Lasergraphics, Inc. has announced two options for its UI-100 printer rasterizer product line based on the Motorola, Inc. 68000 microprocessor. The company also announced a $2,000 price cut on the original model.

The company sells the UI-100T, UO-100B, UI-100A and UO-100P rasterizing units to drive Tektronix, Inc.'s 4691 and Benson, Inc.'s Colorscan printers as well as Advanced Computer Technology, Inc.'s and Printacolor Corp.'s ink-jet color printers.

The basic UI-100 costs $3,500, the company said, and the purchase of one option is required on each unit.

The company previously offered the UI-100 with 110,000 polygon and vector vertices designed for graphics on mainframes, including those from IBM, for a price of $9,950, the compa-

Continued on page 86

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November 26

Data Communications Terminals

In this issue, users and vendors will comment on how terminals are making computers more responsive to organizational needs. Topics include: how to get the most out of dumb terminals; an update on smart and intelligent terminals; and guidelines for determining terminal needs and selecting the equipment to meet them.

Closes November 9

December 31 & January 7

'85 Forecast

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SYSTEMS & PERIPHERALS

Continued from page 84

ny said. The price for this model, now called Option 2, has been cut to $7,750, the company said.

Option 1 provides up to 55,000 vertices for use with mainframes for a price of $1,995 or a total of $5,495. Option 3 provides 220,000 vertices for $6,350 or a total of $9,850, the company said.

Lasergraphics, 17671 Cowan Ave., Irvine, Calif. 92714.

GRAPHICS SYSTEMS

CAE SYSTEMS, INC.
CAE 2000/660

CAE Systems, Inc. has announced that the CAE 2000/660 design automation system is now bundled with Apollo Computer, Inc.'s Domain DN660 color workstation.

The system had been bundled previously with Apollo and Sun Microsystems, Inc. workstations and Digital Equipment Corp. VAX-11 superminicomputers. The CAE 2000/660 can operate in a stand-alone configuration or as a node in CAE's Worksystem distributed network environment for team engineering.

CAE 2000/660 software is said to use color for multiple wave forms, for matching nodes on a circuit diagram to wave forms or for highlighting. Key data can be highlighted in each window with color as well, the company said.

The CAE System comes with either 2M or 4M bytes of main memory and can support up to 24 concurrent processes, each with 256M bytes of virtual address space, the company said. The CAE 2000/660 runs AT&T's Unix operating system. Resolution on the 19-in. CRT is 1,024 by 1,024 pixels, and it can display eight colors simultaneously.

The price of the CAE 2000/660 as a stand-alone workstation with 2M bytes of main memory is $92,400, the company said.

CAE Systems, 1333 Bordeaux Drive, Sunnyvale, Calif. 94089.

OFFICE SYSTEMS

NORSK DATA, INC.
ND-100 Satellite; Dialogue

Norsk Data, Inc. has announced the ND-100 Satellite 16-bit minicomputer, running on the company's Sintran III operating system and the ND-Cosmos network system.

The ND-100 Satellite is said to have the same performance as the large ND-100 Compact models, approximately .22 millions of instructions per second, the company said.

The price for the ND-100 Satellite system begins at $17,000, the company said.

A typical configuration, including a .5M-byte memory, a 23M-byte Winchester disk, a cartridge streaming tape drive, the company's Notis-WP word processing system and Cosmos network connection, eight terminals and a multifunction printer, is approximately $61,000, the company said.

Norsk Data also announced the Dialogue software family for administrative data processing.

The system reportedly includes the Sibas data base management system, referenced by the Unique 2 high-level applications specification and runtime system, the Access interactive query and reporting system, RG high-level report generator and the ABM professional workbench for application building and maintenance.

The price for Unique 2 is $18,400; Access, $7,400; RG, $7,000; and ABM, $5,600, according to the vendor.

Norsk Data, 55 William St., Wellesley, Mass. 02172.

POWER SUPPLIES

NOVA ELECTRIC MANUFACTURING CO.
Uninterruptible power system

Nova Electric Manufacturing Co. has announced a 5 kVA uninterruptible power system (UPS) with solid-state transfer switch, said to be capable of supporting process control systems, emergency lighting or communications equipment.

The UPS is also capable of producing dual-output voltages, such as 120 Vac and 208 Vac. The system regulates frequency from plus or minus .5%.

The product also offers a mean time between failure of 30,000 hours, the company said.

The price for the UPS is $13,500 with transfer switch, the company said.

Nova Electric Manufacturing, 263 Hillside Ave., Nutley, N.J. 07110.

PRINTERS from page 81

troller with a 1.4M-byte page buffer. A 512K-byte memory in the controller is used for storage of up to 96 fonts.

DEC's PDP-11 and VAX-11 computer systems supporting the original LN01 laser printer will support the LN01S printer, according to the company.

The two printers are supported by the VAX/VMS operating system, and the LN01S is supported by all DEC's PDP-11 operating systems, the company said.

Both the LN01V and the LN01S are housed in floor cabinets. The price for the LN01B is $22,250, and the price for the LN01S is $29,995, the company said.

More information on the products is available from DEC, which is located at 146 Main St., Maynard, Mass. 01754.

MITRON'S STD 1600 TRANSFERS DATA AT 56 KB OFF-LINE TAPE-TO-TAPE

Mitron's STD 1600 provides an efficient method for sending and receiving data anywhere in the world. STD 1600s communicate with each other and with other companies' bisynchronous terminals and computers.

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- Bisynchronous protocol
- Transparent or non-transparent
- Space compression
- Variable size records to 16K
- Labels and multiple files

STD 1600 options:
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- Asynchronous
- Code conversion
- Modem eliminator

The STD 1600 is compatible with AT&T's Digital Data Service.

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INFODATA®

TANDEM from page 81

ings, the 6540 series members will be sold to large corporations and are geared to on-line transaction processing environments, according to Jerry Peterson, Tandem's vice-president of international marketing.

Moreover, in sharp contrast to most conventional micros, the workstations were designed to be tightly integrated into larger Tandem systems and networks, Peterson said.

Both members of the 6540 family, code named Dynamite, are said to operate in three modes:

- As an on-line terminal for Tandem's Nonstop I, Nonstop II and Nonstop-TXP mainframes.
- As an IBM 3270-class terminal for on-line access to large-scale IBM processors.
- As a stand-alone, IBM-compatible microcomputer capable of supporting popular application packages and processing host CPU files locally under Microsoft Corp.'s MS-DOS operating system.

As a terminal for Tandem mainframes, the workstations incorporate the same features — including the same function keys — as the company's existing 6530 series of on-line CRT units. But the 6540 family also boasts several enhancements not available with the older Tandem product line, said Gerald Held, the firm's director of strategic planning.

Unlike the 6530 series terminals, which provide an 80-col. display, the workstations support a 132-col. output, Held said. The 6540 line also reportedly comes with a smooth-scroll capability.

As an IBM terminal, the workstations emulate a 3270 and can communicate indirectly with 3030, 3080 and 4300 processors through Tandem mainframes, Held said. The 6540 machines thus duplicate an IBM communications capability that Tandem first made available to its users last February.

When operating as a stand-alone micro, the workstations reportedly offer twice the performance of the original IBM Personal Computer. Held attributed the edge in processing speed to the 6540's 8-MHz Intel Corp. 8086 microprocessor, which is said to outperform its 8088 counterpart in the Big Blue product.

At present, the 6540 family consists of two models — the 6541 and 6546. Both models incorporate a 12-in. monitor and accommodate 256K to 640K bytes of main memory. The two 6540 series members also use a fanless cooling system to minimize noise and support bit-mapped graphics with resolutions as high as 800 by 300 pixels, Held said.

The main difference between the 6541 and 6546 lies in their external storage, Held said. While the former is configured with two 360K-byte floppy disk units, the latter comes with just one such module plus a 10M-byte Winchester system.

To induce organizations to buy the Dynamite products in volume, Tandem is offering users financial incentives in the form of free hardware, Peterson said. Users who acquire 100 or more of the workstations will receive 2M bytes of main memory for their Tandem mainframes at no charge.

For 200 or more 6540s, the deal sweetener increases to 4M bytes, and companies that buy the workstations in volumes of at least 500 will be given a free 4M-byte TXP mainframe, Peterson said.

Prices for the 6541 and 6546 start at $2,995 and $3,995, respectively. The Models 6540 and 5541 dot matrix printers, meanwhile, cost $595 and $895, respectively.

The 6541 is available now, while shipments of the 6546 begin in December.

Tandem is headquartered at 19333 Vallco Pkwy., Cupertino, Calif. 95014.

IRD from page 81

The original suppliers of thin-film disks were Ampex Corp. and Polydisk Systems, but the field now includes more than 30 companies, including Hewlett-Packard Co. and Control Data Corp., the report stated. The only cloud on the marketing horizon for rigid disks is the erasable optical disk, which has not yet been developed with favorable price/performance characteristics, the report stated. "The lack of erasability could pose problems for optical disk suppliers, since users are only familiar with erasable media and may be hesitant about trying something different," the report added.

While shipments of optical disks are projected to be minimal in 1984, the report stated that many companies are gearing up for such shipments, including 3M Corp., Hitachi America, Ltd. and Storage Technology Corp. The penetration of optical disks will be slow, the report anticipated. "Optical disk systems will have to demonstrate that they are less expensive per byte of storage," the report suggested, warning that it would be a mistake to introduce erasable disks before bugs are fixed.

The report predicted the Sony 3½-in. micro floppy will become the industry standard, but noted that if IBM decides on a different size, "it would throw a wrench into the otherwise steady direction" of the market. Some micro users are opting for rigid disk drives, and optical disks could also challenge floppies in the future, the report suggested. The leading supplier of floppy disks is Verbatim Corp., followed by 3M and Dysan, the report stated.

As more and more competitors vie for a share of the market, "virtually all the participants in the computer media business are in for tougher times ahead," according to the report.

The report is available for $1,650 by writing to IRD, 6 Prowitt St., Norwalk, Conn. 06855.

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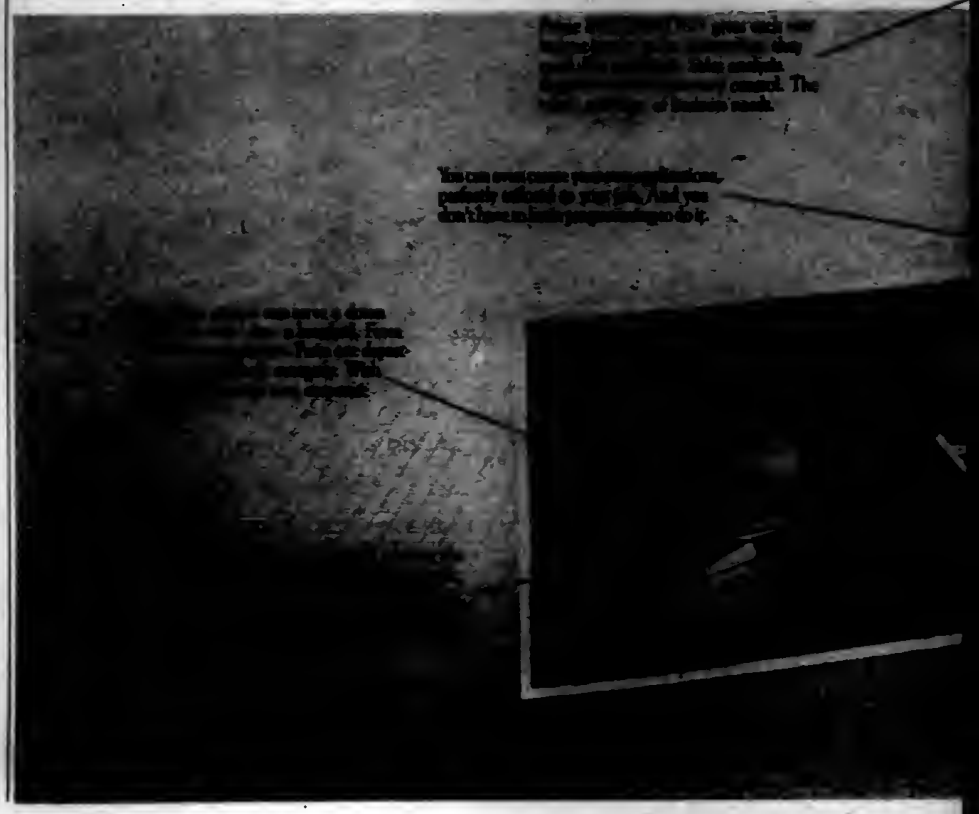

PCM from page 81

a string of problems with its IBM 3380-compatible disk drive, CDC made its second quick exit from the PCM business when the company said it was getting out of the peripheral business.

That move did turn some heads — particularly those of the CDC sales force who apparently had no idea the company was even considering bagging the peripheral group. CDC customers also were taken aback by the announcement.

In 1982, Memorex Corp. merged with Burroughs Corp. To date, Memorex has retained much of its original charter, as a supplier of IBM-compatible products.

However, some analysts see the potential for that situation to change, especially in light of the higher research and development costs associated with keeping up with IBM peripheral technologies.

Still committed

So far, however, Memorex still says that it is committed to the IBM-compatible business.

One marketing executive recently expressed hope that Memorex can clean up in the wake of CDC's exit from the marketplace.

In 1983, Magnuson Computer Systems, Inc. was in the limelight when it filed for Chapter 11 protection from its creditors. While it vowed to make a comeback, Magnuson foundered for about a year, then was absorbed by Storage Technology Corp. as a part of STC's Global Ultimacc Systems, Inc.

The interesting thing about this relationship was that STC was Magnuson's last and, as far as anyone can tell, only customer in its final months. Now, the remnants of Magnuson form Global Ultimacc's processor manufacturing facility.

Big plans

While it was thinking of buying Magnuson, STC also apparently had big plans for getting into the upper end of the IBM-compatible processor business as well.

A limited partnership prospectus that was developed by Smith Barney Harris Upham & Co. dated June 29, 1983, stated that STC was seeking to raise $20 million to develop a Cmos-based line of processors employing very large-scale integration. The line was to compete with IBM's 3080 series.

That project failed within months. Now, with STC's expected poor third-quarter showing, it is unlikely the company will be embarking on many new, risky IBM-compatible ventures.

In addition to STC's losses and CDC's departure from the marketplace, the past two years have seen a lot of activity in the PCM arena.

Technical troubles with its dual-processor, fault-tolerant 4480 had IPL Systems on the brink of disaster. The company appeared to be saved in the nick of time when it struck up a neat deal with AT&T.

Throwing in the towel

Gene Amdahl, who left the company which bears his name to build a bigger IBM-compatible mainframe, formed Acsys Corp. — a short-lived firm which later became known as Trilogy, Ltd. Amdahl recently threw in the IBM-compatible towel when nagging technical problems on Trilogy's wafer-scale technology caused repeated delays in the mainframe project.

The original Amdahl Corp. has been increasingly influenced by Tokyo-based Fujitsu, Ltd., which recently purchased a controlling interest in the company. Interestingly, Fujitsu moved its line of supercomputers into the U.S. market, via the Amdahl product lineup, shortly after buying a controlling interest in Amdahl.

Spartacus Computers, Inc., in what can only be described as a cameo role in the PCM saga, announced a short-lived line of 4300-compatible systems, which never really made it to the marketplace. The company is now trying to develop a line of communications products for IBM mainframes, Personal Computers and non-IBM workstations.

Cambex Corp., perhaps the only PCM not to suffer some trauma in the past two years (mainly because it is too tiny), eliminated some of its older processors from its lineup, but is still offering the same basic 4300-compatible product line.

There you have it, the trials and tribulations of the IBM PCMs. Is the end near? Will all the PCMs go belly-up? Will Gene Amdahl ever get the money to start another company? Will Burroughs convert Memorex into a captive R&D facility for storage products? Will the Japanese wind up buying all the failing U.S. PCM's and turning them into one giant, fabulously successful company? Will IBM beat everyone into submission?

The answers to these and other important IBM-related questions undoubtedly await all of us in the months to come. Stay tuned.

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There are some people who wouldn't buy a Rolls Royce for a buck-ninety-five if it didn't come with a hood ornament.

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For those, we offer this chart showing how the Leading Edge Personal Color FXD Computer differs from the IBM® XT, not a self-serving litany of trivial distinctions, but a straight-up comparison of basic things of righteous concern.

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Ports	Both Parallel and Serial Standard	Serial Standard, Parallel optional—$75.
Expansion Slots	7 slots Standard of which 3 remain open after expansion to 640K	8 slots Standard of which 1 remains open after expansion to 640K
Warranty	One Full Year parts and labor	90 Days parts and labor
Support	Lifetime no charge toll-free hotline Standard. The best in the industry	None on hardware, software optional at $50 per call.
Service	Nationwide Service Centers	Nationwide Service Centers
Price*	$3,995 Complete (Standard 10 MB Hard Disk Configuration)	$5,459 Configured as 10 MB Hard Disk

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MICROCOMPUTERS

SMALL TALK
Paul Korzeniowski

IBM software: Blessing or curse?

Since the introduction of the IBM Personal Computer in 1981, industry analysts have predicted that eventually IBM would attempt to grab as much of the microcomputer market as it could by changing the ground rules.

IBM has repeatedly denied this allegation and steadfastly pointed to the open architecture of the IBM Personal Computer as an illustration of its cooperative nature. But a rash of recent product announcements illustrates Big Blue's hungrier side.

IBM introduced a word processing program that competes with packages such as Multimate International, Inc.'s Multimate. Big Blue stepped into the operating environment arena with Topview. IBM walked on the toes of AST Research, Inc. and other add-on device vendors with a slew of graphics boards and monitors. IBM threw its hat into the computer-aided-design market and also attempted to establish a microcomputer graphics standard with the endorsement of a virtual device interface (VDI). Lotus Development Corp., Ashton-Tate and Peachtree Software, Inc. began to feel Big Blue's heat as IBM unleashed a host of applications packages.

Disturbing implications

No one can deny Big Blue's right to turn a profit, but these announcements — particularly the software introductions — may have disturbing implications for MIS managers.

First, initial reports suggest that the IBM software products do not offer any significant new features or capabilities. The applications and accounting lines were derived from existing packages that run on IBM minicomputers and main-

See REACT page 99

Eastman Kodak produces slides from micro graphics

ROCHESTER, N.Y. — Eastman Kodak Co. has announced a series of products that transforms microcomputer graphics into presentation-quality slides. The products are the Instagraphic Copy Stand, the CRT Slide Imager, the Instagraphic Slide Mounter and Instagraphic Color Slide film.

Kodak officials stated that the products were designed for managers, many of whom make as many as eight business presentations each year. The vendor estimated that in 1984 these presentations required an estimated 557 million slides each year. Yet only 2% of the slides use microcomputer graphics, according to Kodak. The firm estimated that in 1988 this market will produce 984 million slides, and 6% of the slides will utilize personal computer graphics.

The Kodak Instagraphic Copy Stand is said to transform hard copy into slides. A user places any type of output on the Instagraphic Copy Stand and sets the mechanism to one of four sizes of paper. A light indicates when the camera is correctly placed, and the user can then take a picture, Kodak said. The exposed film reportedly can be loaded into the Kodak Instagraphic Slide Mounter and a slide can be produced in 12 minutes.

The Kodak CRT Slide Imager reportedly allows a user to take a picture of a screen display. It consists of three parts: adapter, light shield and camera mounting bracket. Four adapters fit 9-, 12-, 13- and 19-in. CRTs, according to the vendor. The light shield prevents light from ruining a picture and positions the camera, Kodak said. The mounting bracket is said to fit most 35mm cameras.

The Kodak Instagraphic Slide Mounter

See SLIDES page 98

Developer urges software designers to learn from filmmaking techniques

By Kathleen Sullivan
CW West Coast Bureau

Heckel

LOS ALTOS, Calif. — Ask Paul Heckel about the principles of software design, and he will launch into a discussion on how D.W. Griffith, the American director, revolutionized filmmaking with the release of *Birth of a Nation* in 1914.

Urge Heckel to get down to specifics about the process of creating friendly software, and he will quote architect Frank Lloyd Wright, who said, "The two most important tools an architect has are the eraser in the drawing room and the sledgehammer on the construction site."

Read Heckel's recently published book, *The Elements of Friendly Software Design*, and you will discover a chapter devoted to the creative genius of Walt Disney and his team of animators, whose movies gave life to such well-known characters as Snow White and Bambi.

What do filmmakers, architects and animators have to teach software developers? Everything about the art and craft of communicating, said Heckel in a recent interview here.

The 43-year-old Heckel, who has more than 20 years of experience in software development, is founder and president of Quickview Systems. The firm writes software for lap-size microcomputers, with current clients including Sharp Electronics Corp. and Rolodex Corp.

According to Heckel, among all the art forms, the most appropriate one for software programmers to study is filmmaking. Directors employ a variety of skills that would serve the software designer well, Heckel pointed out. They understand who their audience is, they know how to at-

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■ A multiuser relational data base manager for the IBM Personal Computer line has been introduced by Dynamic Microprocessor Associates, Inc./92

INSIDE

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Software Publishing releases enhancements to PFS series

MOUNTAIN VIEW, Calif. — Software Publishing Corp. has announced enhancements to its PFS: Write, PFS:File, PFS:Report and PFS:Graph software products running under Microsoft Corp.'s MS-DOS operating system.

The new release of PFS:Write reportedly permits portions of text to be indented inside a document and right margins to be justified during printing. It is also said to permit selection of PFS:Proof, the firm's proofreading software, directly from the PFS:Write menu.

The new features of PFS:File reportedly include a key for quick copying of identical information from a previous form and the ability to do automatic calculation in a file or to generate a "quick list" of information from a file.

PFS:Graph's new features are said to include support for the Hercules Computer Technology Graphics Card, used for viewing charts on monochrome monitors. PFS:Report's enhancements, meanwhile, reportedly allow users to print only the report's totals, rather than all its data, and also offer invisible columns to permit users to perform calculations on values in one file and display only those results of their report.

PFS:Write, PFS:File and PFS:Graph are priced at $140. PFS:Report is priced at $125, according to the vendor.

Additional information can be obtained from Software Publishing, which is located at 1901 Landings Drive, Mountain View, Calif. 94043.

IBM Personal Computer gains interface, application system

BOCA RATON, Fla. — IBM has announced a conversational program interface and an interactive application development system for the IBM Personal Computer.

According to an IBM spokesman, the EZ-VU Runtime Facility provides a conversational interface between the user and an application program. It receives commands and information through predefined screens and transfers the information to the Personal Computer application program. It returns information from the application to the user.

The EZ-VU Runtime Facility's display services allow a previously defined panel to be displayed upon request, and its select services allow a hierarchy of selection panels to be displayed or dialogue functions to be invoked. In addition, variable services allow dialogues to define and to use variables and to provide a high-level interface to IBM DOS functions. The software supports programs written in IBM Personal Computer Cobol, Fortran, Interpretive Basic, Compiled Basic, Pascal and Macro assembler.

IBM's EZ-VU Development Facility is said to provide a program developer with the ability to develop more sophisticated, interactive Personal Computer applications with less coding effort. It can also be used to provide a consistent interface to the end user. The IBM spokesman said the EZ-VU Runtime Facility is required for integration of applications with the EZ-VU Development Facility.

See IBM page 98

DBMS offered for IBM micros

NEW YORK — A multiuser relational data base management system (DBMS) for the IBM Personal Computer, Personal Computer XT and Personal Computer AT has been introduced by Dynamic Microprocessor Associates, Inc.

The data base manager, Formula IV, is said to allow several users to access the program via either terminals or personal computers attached to a Personal Computer's serial ports. Formula IV offers record locking and file sharing and can provide three users simultaneous access to the same Formula IV application.

The software runs under IBM's PC-DOS 2.0 and is said to offer an on-screen, dual-window text editor that displays a report page as it will be printed. In addition, context-sensitive Help screens and an English-based query language reportedly are provided.

Formula IV permits the creation of reports containing 12 files, with up to 99 million records and 200 fields, according to the vendor. Once the system requirements are entered, the software's application generator reportedly can automatically establish reports, files, sorts, updates, menus and data-entry procedures.

Formula IV is priced at $695. Additional details are available from Dynamic Microprocessor Associates, 545 Fifth Ave., New York, N.Y. 10017.

Software Connections unveils enhanced electronic mail package

SANTA CLARA, Calif. — Software Connections, Inc. has enhanced LAN:Mail Monitor, an electronic mail package designed for local-area networks that support microcomputers from IBM, Compaq Computer Corp., Eagle Computer, Inc. and Texas Instruments, Inc.

The package reportedly allows users to send memos, transfer files and share peripheral devices. Enhancements include an edit and forward feature that allows one person to take a letter or memo from an author, make comments on it and return it to the author, the company said.

A key word search capability assists users in locating memos dealing with a specific subject, composed by a certain author or mailed on a specific date, according to the vendor. Another feature is said to allow single-station users to call in from a remote location and read their letters or send letters to other users.

LAN:Mail Monitor reportedly has added a menu-driven interface and a forms option that allows a receptionist to create a phone message form for recording incoming calls.

The software is available in two forms. A local-area network version supports up to 25 users and costs $745. A remote network version, which supports up to 10,000 users and includes modem software for communication over phone lines, sells for $1,195, with single-user options priced at $195 each.

Software Connections is located at 2041 Mission College Blvd., Santa Clara, Calif. 95054.

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97 Lowell Road Concord, MA 01742
TLX 750246 SOFTWARE CNCM

SOFTWARE

C. ABACI
Scientific Desk for IBM Personal Computer

C. Abaci has introduced a version of Scientific Desk for the IBM Personal Computer running IBM's Professional Fortran.

Scientific Desk, a utility, features a library of callable subroutines, a set of problem-solving environments and a friendly user interface, C. Abaci said.

The product reportedly features mathematical functions such as arithmetic and error analysis, elementary and special functions of mathematical physics, interpolation and solutions to nonlinear equations. Problem solvers are said to allow solutions to eigensystem analysis, linear algebraic equations, matrix and vector arithmetic, statistical inference and estimation problems.

Scientific Desk costs $420.

C. Abaci, 208 St. Mary's St., Raleigh, N.C. 27605.

TYMSHARE, INC.
Acustar for IBM Personal Computer XT/370

Tymshare, Inc. has released a version of the Acustar marketing decision support system that runs on an IBM Personal Computer XT/370.

Designed for consumer goods companies, Acustar provides access to a number of syndicated and internal data sources, according to the vendor. Typical applications are said to include brand reviews, promotion evaluation and planning, test market tracking and forecasting. Results reportedly can be displayed in reports or color graphics.

A standard configuration of Acustar, which includes 20M bytes of hard-disk storage, monochrome monitor, graphics printer, security board, 1,200 bit/sec internal modem, IBM's PC-DOS 2.1 and VM/PC operating systems and Tymshare's Tymcomm microcomputer-to-mainframe link costs $50,000.

Tymshare, 1281 Main St., Stamford, Conn. 06092.

MICROCOMPUTERS

DIGITAL RESEARCH, INC.
DR Draw

Digital Research, Inc. has announced a version of DR Draw designed for Corona Data Systems, Inc. microcomputers.

The package produces graphics with better resolution than those designed on an IBM Personal Computer, the vendor said. It reportedly has a resolution of 640 by 325 pixels on all Corona personal computers except the Model PB400, where it provides a resolution of 640 by 400 pixels.

DR Draw is said to enable a user to combine text and graphs in organizational charts, flow charts, technical drawings, maps and logos.

DR Draw, including Digital Research's GSX graphics system extensions to Microsoft Corp.'s MS-DOS operating system, is priced at $295.

Digital Research, P.O. Box 579, Pacific Grove, Calif. 93950

HAYES MICROCOMPUTER PRODUCTS, INC.
Six Please templates

Hayes Microcomputer Products, Inc. has announced six application templates that work with Hayes' Please, a data base management system for the IBM Personal Computer with IBM's PC-DOS operating system. They include Cash Flow, Inventory, Invoices, Ledger, Payroll and Stocks.

Cash Flow helps estimate monthly cash requirements, plans for discounted payments, maintains a monthly check register and tracks expenses, according to the vendor.

Inventory reportedly monitors inventory data and flags items that have dropped below reorder point.

Invoices is said to produce daily or weekly invoices from sales data.

Ledger provides monthly or year-to-date operating income before taxes at department or regional levels, Hayes said.

Payroll reportedly generates detailed and summary payroll reports, summarizes payroll by expense code and prints worksheets for quarterly payroll reports, W2 forms and annual 1099 reports.

Stocks records stock and bond purchases and sales while monitoring current portfolio value and commission costs, according to the vendor.

Each template costs $29.95. Please sells for $349.

Hayes Microcomputer Products, 5923 Peachtree Industrial Blvd., Norcross, Ga. 30092.

RAND GROUP, INC.
Rand-Micas

Rand Group, Inc. has released a version of Rand-Micas, a structural analysis and design package that runs on IBM's Personal Computer XT or Personal Computer AT with IBM's PC-DOS.

The package is used for frame and finite element structural analysis and design, the vendor said. It provides six model types, including plane stress, thin plate, axisymmetric, solid and thin shell.

Rand-Micas can process linear static, nonlinear static and dynamic analyses, according to the vendor. It produces two- and three-dimensional analysis with beam, truss, gap and hook elements and uses a large library of general finite elements.

The cost of Rand-Micas ranges from $6,000 to $10,000.

Rand Group, Suite 114, 17490 Campbell Road, Dallas, Texas 75252.

VIRTUAL DEVICES, INC.
Robo-C

Virtual Devices, Inc. has announced a C compiler for use with Motorola, Inc.'s 6801 microchip. The Robo-C compiler runs under Microsoft Corp.'s MS-DOS or Digital Research, Inc.'s CP/M operating systems and compiles standard C source code into 6801 code.

The package includes a C cross-compiler, 6801 relocating cross-assembler and standard libraries as well as 6801 and Heath Co.'s Heath Hero interface software.

According to the vendor, the Robo-C compiler is priced at $249; the assembler alone is $90.

Virtual Devices, Suite 104, 4801 Montgomery Lane, Bethesda, Md. 20814.

AUTODESK, INC.
Autocad for IBM 3270G/GX

Autodesk, Inc. has released a version of its Autocad drafting software for use with the IBM 3270 Personal Computer/G and 3270 Personal Computer/GX microcomputers running under IBM's PC-DOS.

The computer-aided design package is designed to take advantage of the 3270's graphics technology.

The 3270 G/GX version of Autocad reportedly supports IBM's Picture Interchange Format micro-mainframe protocol and uses the enhanced workstation capacity for high-speed picture regeneration and character generation.

The price of Autocad for the 3270 G and 3270 GX is $1,000 for the basic package, with two advanced drafting extensions priced at $500 each.

Autodesk, 2658 Bridgeway, Sausalito, Calif. 94965.

SYSTEMS

TOMAX, INC.
LPC-1000

Tomax, Inc. has unveiled the LPC-100, which combines laser video disk and microcomputer capabilities.

The product features an Intel Corp. 8086 microprocessor, Digital Research, Inc.'s CP/M-86 operating system and color graphics resolution of 640 by 400 pixels, Tomax said.

Tomax's digital data encoding

Continued on page 94

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MICROCOMPUTERS

Continued from page 93

scheme compresses text, program and audio data on 12-in. laser disks, the vendor said. A disk reportedly can store motion sequences lasting from one second to one hour, more than 100,000 still images, more than 100 hours of audio information and up to one million pages of text.

Applications for LPC-100 include interactive training, electronic publishing and local reference data bases, according to Tomax.

LPC-100 costs $9,750.

Tomax, 5800 Andover Ave., Montreal, Quebec, Canada H4T 1H4.

INTEL CORP.
Idis 715

Intel Corp. has announced an enhanced version of its Idis data base information system running under Microsoft Corp.'s Xenix operating system.

According to a spokesman, the Idis 715 is based on Intel's 286/310-41 supermicrocomputer and offers 40M bytes of hard disk storage. It utilizes the Intel 80286 microprocessor for rapid data sharing and processing among 10 terminals and microcomputers.

The system reportedly allows users to access data bases and file systems on a mainframe and enables MIS personnel or programmers to create specialized applications.

Under Idis 715, mainframe data files are downloaded, stored locally in a relational data base management system (DBMS) and then shared by a network of up to 10 terminals, micros and remote job entry communications ports.

Idis 715 provides Intel's Data Pipeline connection to allow a network of terminals and micros access to data stored in data bases on virtually any mainframe, the spokesman said.

The system allows users to retrieve information either specifically from a single DBMS, such as Intel's System 2000, or generically by a process that gains access to any application file or DBMS, the spokesman said.

Idis 715 also features application development tools, including a menu development system, a C compiler, a text editor and all Xenix utilities.

The basic Idis 715 system with Xenix 3.0 is priced at $20,240.

Intel, P.O. Box 9968, 12675 Research Blvd., Austin, Texas 78766.

COMMUNICATIONS

DOW JONES SOFTWARE
Straight Talk

Dow Jones Software, a division of Dow Jones & Co., has introduced Straight Talk communications software for the Apple Computer, Inc. Macintosh microcomputer.

Straight Talk allows users to access information from over 20 data bases on the Dow Jones News & Retrieval Service, according to the vendor.

That service reportedly includes the entire text of *The Wall Street Journal*, a 20-volume encyclopedia and financial and business information, as well as sports news, weather reports and movie reviews.

Straight Talk reportedly can automatically guide the user through the initial data base setup procedures and into the program itself.

It also allows the user to communicate with other Macintosh computers via a modem, according to Dow Jones.

Straight Talk is priced at $79.

Dow Jones, P.O. Box 300, Princeton, N.J. 08540.

GOOD SOFTWARE CORP.
Let's Talk

Good Software Corp. has introduced its Let's Talk communications software package for the IBM Personal Computer, Radio Shack Corp.'s TRS-80 and 2000 and Compaq Computer Corp. microcomputers.

Let's Talk reportedly permits conversational interaction and direct connection between personal computers using standard telephone service and modems.

The package also allows files to be transferred to and from attended and unattended personal computers at 300, 1,200 or 2,400 char./sec, according to the vendor.

No size limitations are made on data file transfers, Good said. Transferred files reportedly may be renamed.

Let's Talk is priced at $179.

Good Software, Suite 600, 12900 Preston Road, Dallas, Texas 75230.

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MICROCOMPUTERS

FORTE DATA SYSTEMS, INC.
Forte PJ

Forte Data Systems, Inc. has introduced Forte PJ, a terminal emulation package for the IBM Personal Computer AT.

The product allows the microcomputer to emulate an IBM 3278 or 3279 terminal and fits into one of eight expansion slots on the Personal Computer AT, the vendor said. With Forte PJ, a user reportedly can toggle between a Microsoft Corp. MS-DOS operating system and mainframe modes.

Forte PJ, including the board and software needed to drive it, costs $1,195.

Forte Data Systems, 2205 Fortune Drive, San Jose, Calif. 95131.

FTC COMMUNICATIONS, INC.
Message Handler

FTC Communications, Inc. has introduced Message Handler software, which allows an IBM Personal Computer or compatible machine to function as a Telex terminal.

Message Handler reportedly allows foreground and background operations. The software handles inbound and outbound calls simultaneously, allowing a user to send and receive messages while working on a spreadsheet or other programs, the vendor said.

The program can also merge word processing files from packages such as Micropro International Corp.'s Wordstar and Lifetree Software, Inc.'s Volkswriter.

Message Handler costs $295.

FTC Communications, 90 John St., New York, N.Y. 10038.

GLENN A. BARBER & ASSOCIATES, INC.
Pro-3101

Glenn A. Barber & Associates, Inc. has announced a communications package said to allow the Wang Laboratories, Inc. Professional Computer to appear to an IBM host as an IBM 3101 terminal.

Pro-3101 reportedly allows the Wang Professional Computer to operate either in interactive character mode or in screen-oriented block mode, providing flexible asynchronous communications with a variety of IBM systems.

Required hardware includes a Wang monochrome controller card and display and a standard 128K-byte CPU board, the vendor said.

The package costs $275.

Glenn A. Barber & Associates, 15010 Ventura Blvd., Sherman Oaks, Calif. 91403.

CONTEL-CODATA SYSTEMS CORP.
PC Works; Sofgram

Contel-Codata Systems Corp. has announced two software packages, PC Works and Sofgram, that link its Motorola, Inc. 68000-based microcomputers running AT&T's Unix to an IBM Personal Computer.

PC Works reportedly enables a Codata 3300 system to interface to an IBM Personal Computer, enabling the Personal Computer to operate as a Unix terminal; read, create and send mail; send and receive data files and programs to and from a Unix system; and execute Unix applications.

Sofgram is said to enable Codata micros to create, transmit and receive messages on teletypewriter exchange systems.

Each package costs $500.

Contel-Codata Systems, 285 N. Wolfe Road, Sunnyvale, Calif. 94086.

NETWORK SOFTWARE ASSOCIATES, INC.
Adaptsna 3270 enhancements

Network Software Associates, Inc. has enhanced Adaptsna 3270, a communications package that runs on the IBM Personal Computer.

The enhancement consists of the Application Programming Interface (API), a file transfer facility that allows applications running on the IBM Personal Computer to exchange data with applications running on an IBM mainframe, the vendor said.

Adaptsna reportedly emulates the IBM 3274 Model 51C control unit and 3278 terminal. API is said to contain five software procedures that can be linked to the user's program to simplify the file transfer.

Adaptsna 3270 runs on an IBM Personal Computer with IBM's PC-DOS, 192K bytes of memory and an IBM Synchronous Data Link Control card.

Adaptsna costs $325.

Continued on page 96

your per-message transfer costs.

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San Francisco, California 94107

MICROCOMPUTERS

Continued from page 95

Network Software Associates, 19491 Sierra Soto, Irvine, Calif. 92715.

3COM CORP.
Etherseries support for IBM Personal Computer AT

3Com Corp. has announced that its Etherseries will support the IBM Personal Computer AT under Microsoft Corp.'s MS-DOS 3.0 on the 3Com local-area network, an Ethernet-based system.

Etherseries support, 3Com said, will allow customers to link the Personal Computer AT to products from multiple vendors for sharing software, diskettes and printers and to send electronic mail, all via the 3Com network. Etherseries software is also said to permit the use of the Personal Computer AT as an Etherseries network server and as a fully functional workstation.

The Etherseries upgrades, offering Personal Computer AT support, are priced as follows: Ethershare, $99; Etherprint, $49; and Ethermail, $75.

3Com, P.O. Box 7390, 1365 Shorebird Way, Mountain View, Calif. 94039.

STORAGE

EMERALD SYSTEMS CORP.
Back Up & Restore Utility

Emerald Systems Corp. has announced Back Up & Restore Utility (BRU), a series of hard disk drive and ¼-in. internal tape drive systems for the IBM Personal Computer AT.

BRU expansion systems range from 40M to 280M bytes of hard disk storage and reportedly function 30% faster than the AT's hard disk device. The 60M-byte tape unit fits in the AT's enclosure and takes only 12 min to back up 60M bytes of data, according to the vendor.

BRU is said to provide menu- and command-driven file management and 4M bytes of disk caching that can be configured by the user.

The tape units cost $1,960, while prices for the disk drives range from $4,350 to $15,950.

Emerald Systems, 4901 Morena Blvd., San Diego, Calif. 92117.

AQUIX ADVANCED SYSTEMS CORP.
AQMS 513

Aquix Advanced Systems Corp. has announced AQMS 513, a hard disk subsystem designed for the IBM Personal Computer.

AQMS 513 consists of a 14-in. hard disk with a capacity of 411M bytes of storage and a 160M-byte streaming tape drive, the vendor said. The product reportedly provides an interface between IBM's PC-DOS operating system and the storage system and is recommended for incorporation into local-area networks.

AQMS 513 costs $23,995.

Aquix Advanced Systems, 140 Adams Blvd., Farmingdale, N.Y. 11735.

1² INTERFACE, INC.
Cartridge tape subsystems

A series of 5¼-in., half-height removable cartridge tape subsystems for the IBM Personal Computer has been offered by 1² Interface, Inc.

The units, in a range of storage capacities from 10M- to 60M-bytes, reportedly were designed to interface with standard Winchester and Shugart Corp. SA 450 diskette drives as well as 1² Interface's Winchester Disk-systems and diskette drives.

The 10M-byte unit is priced at $1,045, the 45M-byte unit at $2,595 and the 60M-byte unit at $2,695.

1² Interface, 21101 Osborne St., Canoga Park, Calif. 91304.

STRUCTURED SOFTWARE SYSTEMS, INC.
MSROM

Structured Software Systems, Inc. has enhanced MSROM, an interface for Hewlett-Packard Co.'s 9845B/C desktop computer.

MSROM enhancements reportedly allow the 9845B/C to interface with a number of disk drives including HP's 9122, a 3½-in. microfloppy, the 9130 series of Winchester disks, the 7940 Winchester family and the 9144 streaming tape drive. The product is said to work with any disk drive that conforms to HP's Command Set/60 or Subset/90 protocols.

MSROM costs $600.

Structured Software Systems, 1072 Irick Road, Mount Holly, N.J. 08060.

See STORE page 98

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If your networking plans include more than five or six PCs, high performance isn't a luxury. It's critical.

The Net/One Personal Connection™ packs the microprocessing power to offload all networking functions, so it doesn't eat up the host CPU's resources. That frees up a work station that other systems require simply to do their network's work.

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MICROCOMPUTERS

STORE from page 96

CONTROL DATA CORP.
Control Data Storagemaster 745

Control Data Corp. has introduced its Control Data Storagemaster 745 cartridge streaming tape system for backup storage of IBM Personal Computer and Personal Computer XT systems.

The CDC Storagemaster 745 is said to be compatible with IBM and Storagemaster fixed-disk systems, providing data integrity as files are transferred from hard disk to backup storage. The Storagemaster 745 reportedly stores up to 45M bytes of data using ¼-in. tape cartridges.

Three of the storage system's software commands are said to simplify its use and to provide a means to back up files, restore files, read directory information from tape and determine tape cartridge condition.

The CDC Storagemaster 745 is priced at $2,495.

Control Data, Storagemaster Marketing, 2200 Berkshire Lane N., Plymouth, Minn. 55441.

IBM from page 91

The system's screen editor reportedly provides full screen support allowing the user to create and modify screens interactively with program function keys. Screens may be designed in color, monochrome or with levels of emphasis. Field definition allows various editing, translating, verification and range checking to be performed by the EZ-VU Runtime Facility. A sample panel facility allows the user to create similar panels from previously defined panels.

The EZ-VU Runtime Facility is priced at $55, and the EZ-VU Development Facility is priced at $130.

IBM can be reached through P.O. Box 1328, Boca Raton, Fla. 33429.

SLIDES from page 91

($75) allows a user to place processed film from a Kodak Instagraphic Copy Stand or CRT Slide Imager into a slot, press a handle and produce a trimmed, mounted, 2- by 2-in. 35mm slide.

Kodak Instagraphic Color Slide film is used with the products, and a 10-picture roll costs $13. The Kodak Instagraphic Copy Stand costs $549. The Kodak CRT Slide Imager's light shield and mounting bracket costs $339; 9-, 12- or 13-in. adapters cost $40, and a 19-in. adapter costs $50. All products will be available in the first quarter of 1985, Kodak said.

Eastman Kodak is located at 343 State St., Rochester, N.Y. 14650.

STANDARD DATA CORP.
Winchester subsystems

Standard Data Corp. has introduced a series of Winchester hard disk subsystems for the IBM Personal Computer and Personal Computer XT.

The subsystems include a random read/write tape cartridge storage system, a data transfer rate of 5M bit/sec and the ability to emulate a Winchester hard disk system during file transfer, according to the company.

The units are said to be provided in capacities ranging from 12M bytes to 86M bytes.

According to the vendor, the Standard Data drives are priced as follows: 12M bytes, $2,795; 19M bytes, $2,895; 26M bytes, $3,595; 40M bytes, $4,795; 51M bytes, $5,595; 67M bytes, $6,495; 86M bytes, $6,995.

Standard Data, 3040 S.W. 10th St., Pompano Beach Fla. 33069.

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or an ink jet,

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REACT from page 91

frames. The data base manager, central to the applications line, is a flat file, not a relational data base management package. With the plethora of well-designed products available, the last thing the microcomputer industry needs is another vendor peddling mediocre products.

Secondly, IBM deliberately designed products that would not work with other vendors' wares — even though in many cases these vendors had established de facto microcomputer standards. This tendency creates problems for the corporate microcomputer manager as well as for IBM's competition. For example, one microcomputer manager pointed out that the IBM PC Displaywriter word processing package does not work with his company's current communications boards.

The IBM offerings do not work with other vendors' products and, in many cases, are incompatible with each other. The new applications line, accounting line and VDI packages do not run under Topview. These products were developed by distinct IBM groups that appear to be competing against both one another and existing vendors.

Despite these limitations, most people think the recently announced products will be successful simply because they carry an IBM logo and the accompanying security blanket of IBM's exceptional support and service.

But in the Personal Computer arena, is IBM support and service reality or myth?

Many microcomputer managers claim IBM Personal Computer service stops when the machines are dropped at the loading dock, and corporations often turn to dealers or in-house support staffs to configure and test the machines.

Yet MIS managers seem to possess an unwavering faith in Big Blue. Time after time, they march to IBM's drum: Most waited until IBM announced its Personal Computer before purchasing microcomputers. If they fall into line and transform IBM into a major microcomputer software developer, other leading microcomputer software companies may totter. But more importantly, managers may find more new problems than solutions.

or a dot matrix,

or a color dot matrix,

or a train printer,

or even a plotter. Because we alone give you the choice of all [illegible].

[illegible] speeds.

[illegible] make more than 70 different printer models, from personal computer printers to printers for our large computers.

We offer you an infinite choice of printing styles. From data printouts to IBM letter-quality printing. Color. Graphics. Electronic forms. And illustrations.

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IBM

IBM PRINTERS

Printing Power

FILM from page 91

tract and maintain their viewers' interest, and they realize the importance of using visual images and metaphors to communicate a message.

Griffith's *Birth of a Nation* provides an important starting point, Heckel said, because it signaled a change in direction for films. Griffith took filmmaking, which had previously been seen as an engineering task, and translated it into an art form.

Prior to the release of *Birth of a Nation*, filmmakers did little more than point their cameras at a scene and wind the crank, Heckel said. Griffith contributed the techniques now associated with modern filmmaking: the close-up, the moving shot, the fade, the cutaway and the dissolve.

Today, software programmers are at a crossroads, according to Heckel. Until now, their work has carried the imprimatur of the engineer. What is needed now is a creative approach, Heckel said.

"In order to design friendly software, programmers have to let their imaginations go," he said. The transition will not be an easy one, he warned. Engineers and programmers have several counterproductive instincts that stand in the way of creating friendly software, he said. Among the instincts:

- Engineers base software designs on their own knowledge, rather than the user's. Only as an afterthought, if at all, do engineers think about communicating their concepts to the user, Heckel said.
- Programmers focus on a program's internal organization and ignore the external structure. Communicators, by contrast, are primarily concerned with how the user perceives the external structure.
- Engineers think logically. A good communicator, as well as a good software designer, will think about how things work visually.

According to Heckel, engineers are preoccupied with how programs work, rather than the effect they accomplish. But to reach the new audience of users, software programmers need to learn a different approach.

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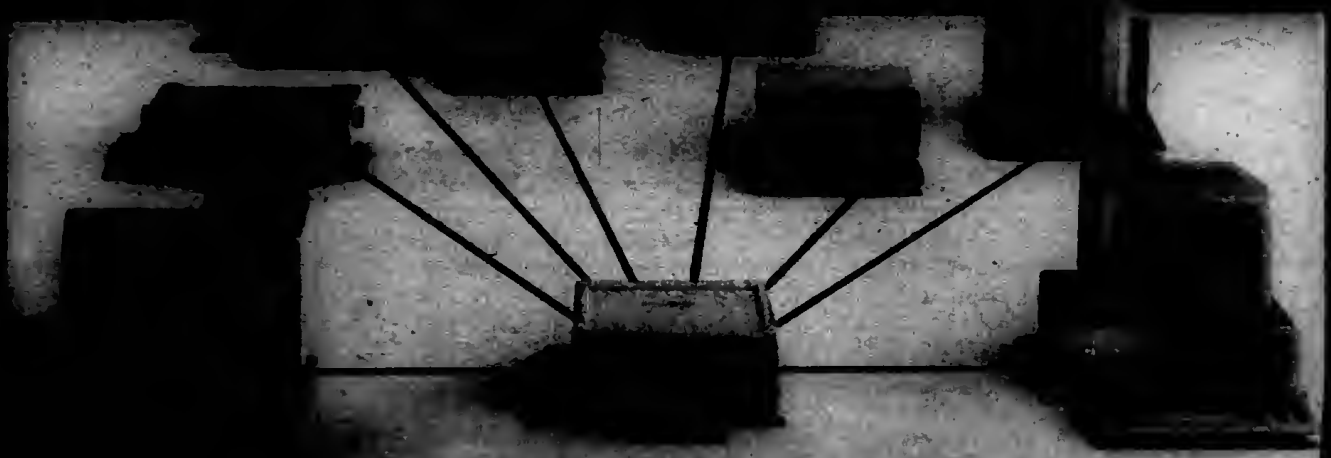

[illegible] they [illegible] the first time [illegible] together [illegible] short of [illegible]. Until now. [illegible] that's it's the [illegible] growth path. Just [illegible]

[illegible] income [illegible] with- [illegible] it's the [illegible] and [illegible] IBM PC AT.

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COMPUTER INDUSTRY

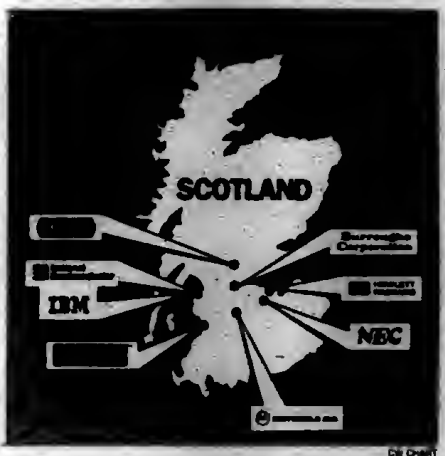
Industry-rich glen boon to Scotland's growth

By James Connolly
CW Staff

GLASGOW — After almost a decade of lobbying overseas and developing property at home, the agency chartered to build Scotland's industry has found that diversification and spin-off support companies are keys to the computer industry's success.

To the Scottish Development Agency (SDA), which runs a program called Locate In Scotland (LIS), success means more than having attracted £1 billion of foreign electronics investment in three years. It means more than having some 300 electronics companies locate in its Silicon Glen.

The nation of whisky, tartans and highlands has seen its traditional employers — coal mines, steelworks and shipyards — linger near death. The government learned by experience that development involves more than having a computer company install an assembly line in a government-owned factory and then watching the firm move along when a new suitor appears or a product line collapses.



CW Chart

"We're most encouraged by the increasing depth of some operations, and we hope it continues. Hewlett-Packard Ltd. is doing all of the research and development for [its] Scottish operation right here. [Motorola, Inc.] is doing [its] European marketing from here, and [Digital Equipment Corp.] has started doing very large-scale integration work in addition to [its] assembly," noted Mike Sandys, senior project executive for SDA.

According to Sandys, that type of integration lends a greater sense of commitment to an American company's presence in Scotland, although the agency recognizes that most industrialists use assembly — where most jobs are unskilled and low paying — as a first step into a new country.

It is the more sophisticated operation that creates better jobs for skilled or educated workers, such as engineers, according to SDA officials.

SDA wants foreign investment to spur Scottish entrepreneurs to start their own businesses, supporting and sometimes competing with the American, German, English and Japanese manufacturers' Scottish operations.

See SCOTS page 104

■ The U.S. Congress has approved legislation offering 10 years of protection to semiconductor designs/112

■ Dysan Corp. has reportedly laid off 500 workers and cut off financing for its "seedling" companies as part of a major shake-up aimed at reducing its financial loses/114

■ Lotus Development Corp. has settled a $1 million copyright infringement suit against a Tennessee health care group for an undisclosed sum/118

Software firms mull cooperative research project

By David Olmos
CW Staff

SAN DIEGO — Eleven high-technology companies that develop software for military applications are discussing whether to band together in a joint research project.

Considering the move are TRW, Inc.; Ford Aerospace & Communications Corp.; Boeing Co.; General Dynamics Corp.; E-Systems, Inc.; Science Applications Inter-

See DEFENSE page 124

Lessors wary of ties with IBM Credit

INDUSTRY INSIGHT
Peter Bartolik
CW Senior Editor

The relationship between the Computer Dealers and Lessors Association (CDLA) and IBM Credit Corp. has been characterized by an underlying degree of tension.

Since IBM Credit served notice in 1982 on third-party leasing companies stating that IBM would not simply ignore the leasing opportunities inherent in IBM's decision to discourage rentals directly from the corporation, a new dynamic has been present in the third-party industry.

International Data Corp., a market research firm in Framingham, Mass., has pegged IBM Credit as the company writing the greatest amount of leases this year, leasing an estimated $100 million worth of equipment each month. That figure is not without argument, however, with other market research firms claiming that Comdisco, Inc. remains the leading leasing company.

Regardless, IBM Credit has clearly

See LESSORS page 124

CDLA votes down restrictions, agrees to 'play ball' with IBM Credit

By Peter Bartolik
CW Staff

NEW YORK — The Computer Dealers and Lessors Association (CDLA) recently moved toward closer relations with IBM Credit Corp. and other nonindependent participants in the burgeoning third-party computer market.

At its annual meeting here, the 240-member association voted against a motion to tighten restrictions on IBM Credit's use of the association's CDLA-Net, an electronic network for equipment transactions.

CDLA members also voted for a straw poll motion to grant associate memberships to so-called "captive credit corporations," such as IBM Credit, a soon-to-be-formed AT&T Credit Corp. and other units performing leasing and financing activities for such companies as Digital Equipment Corp. and Burrough Corp.'s Memorex Corp. subsidiary.

On the issue of IBM Credit participating in the electronic transaction network, CDLA members said that during a closed meeting, a motion from the floor seeking to deny IBM Credit participation was overwhelmingly voted down during a voice vote. The actual straw poll was made by paper ballot, but the results were not made public.

Outgoing CDLA President Richard Forsythe of Forsythe/McArthur Associates said about 30 to 40 people spoke in favor of barring IBM Credit from the electronic network.

Thomas C. Martin, a CDLA director, said the minority believed IBM Credit would not make equipment available over the network and would use it to obtain strategic information on IBM Credit competitors. But Martin, head of Computer Financial, Inc., said IBM Credit has only been in business for two years and writes 36-month leases, so it presently has no equipment for resale.

"We should work with [IBM Credit], otherwise they will develop a separate channel [for distribution of used equipment] all the quicker," he said.

That view was reiterated by Edward Cherney, president of CMI Corp. and chairman of the CDLA's IBM relations committee. "Either we play ball with [IBM Credit] or they will go and play in their own ballfield," Cherney said.

IBM Credit has been pegged by the Framingham, Mass.-based research firm International Data Corp. as the leading leasing firm in 1984, with an estimated $100 million of equipment being put out on leases each month. Many CDLA members said they are concerned about what will happen when IBM Credit leases begin to terminate and a flood of used equipment enters the resale market.

On the issue of offering some type of membership to captive credit corporations, Forsythe said the straw vote was to get a sense of the membership; a mechanism will still have to be established by the CDLA board of directors. One industry source familiar with both IBM Credit and AT&T's plans for a credit corporation said both desire membership in CDLA, but have not been willing to request it for fear of being voted down.

In another straw vote, the membership supported the creation of a new type of associate membership for financial corporations and banks, which have been playing an increasing role in lease transactions, either by bankrolling purchase equipment or investing in tax-leveraged leases. Forsythe said the CDLA is anticipating triple growth of the leasing and dealing industry by 1990 and is concerned about financing that growth. The motion was offered because current CDLA rules require dues based on gross revenues, which would make membership very expensive to banks, Forsythe said.

Third-party lessors expanding away from CPU market

NEW YORK — The third-party computer leasing industry is growing at a annual rate of 30%, but participating companies are diversifying away from the central processor market, according to a survey released here recently.

The survey results disclosed at the annual meeting of the Computer Dealers and Lessors Association showed that third-party companies are aggressively pursuing peripherals and other markets as the CPU market matures.

The survey, by International Data Corp. (IDC), revealed that 25% of the 73 companies who participated have offered software leases, and another 10% plan to do so.

The leasing and brokerage companies generated 73% of their revenues from buying, selling or leasing peripherals and only 24% of revenues from CPUs, IDC said.

The third-party companies are losing market share in the CPU market, which is the most mature segment of the leasing industry and is growing at only 6.5% annually, according to IDC. The third-party lessors have begun concentrating on peripherals to make up for a loss of opportunities in the mainframe market, IDC said.

Only 4% of the respondents said they deal primarily or only in non-IBM equipment, according to the survey. With the large concentration on IBM equipment, the potential impact of a rapidly growing IBM Credit Corp. was seen as severe or significant by 53% of the respondents. IBM Credit Corp., founded just two years ago, will generate an estimated $312 million in revenues this year, with a 92% increase in lease values this year and 50% increase next year, IDC said. The third-party industry as a whole is expected to grow at 30% a year through 1987, IDC said.

The participants in the survey all reported 1984 revenues of less than $300 million, with 32% reporting revenues in the $1 million to $5 million range. The top five leasing companies in the industry did not participate in the survey, IDC said. Only 10% of the participants said they primarily market to the Fortune 500 companies, but 92% said their primary market is the Fortune 1,000 companies.

Insurance as protection

Concerning residual values — the projected value of equipment when its lease term is ended — 14% of the companies said they utilize insurance to protect themselves against lower than expected residual values. Another 10% of those who do not presently obtain such insurance said they are planning on considering insurance.

Despite periods of bad publicity and skepticism from investors, the third-party industry has grown at an astounding rate, IDC said. Companies participating in the industry are projected to have revenues of $7.6 billion this year and $9.8 billion in 1985, according to IDC. The value of equipment involved in transactions this year was estimated by IDC at $26 billion.

Business this year was rated good to excellent by 91% of the respondents, and 94% said next year will be the same. However, 41% said they believe they need to diversify to stay competitive, and 62% said they need to be more creative to remain competitive.

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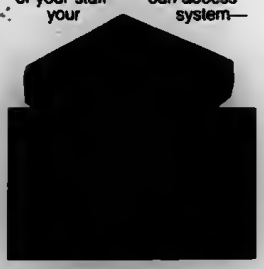

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SCOTS from page 101

Two examples of start-ups cited by SDA are Rodime Ltd. and Prestwick Circuits Ltd.

Rodime, a Winchester disk drive manufacturer founded by former Burroughs Corp. employees, has expanded its sales and manufacturing operations into the U.S. market.

Prestwick Circuits, located in the Scottish west coastal town of Irvine, recently announced a £13 million, 200-job expansion made possible by a contract to supply printed-circuit boards for IBM's Personal Computer AT, which is being assembled for European distribution at Greenoch.

One building block for Scottish-owned businesses is Prime Minister Margaret Thatcher's mandate to SDA and other development agencies throughout Britain, calling for the agency to take on a commercial role. That policy allows SDA to invest in new domestic ventures, taking up to 29% equity in a company.

To attract international investment, the LIS program has four offices in the U.S., competing with agencies in Wales, Ireland, England and Northern Ireland.

All of those agencies offer packages such as capital grants, customized factories and tax breaks, as well as an entry into the duty-free European Economic Community and labor that is less costly than in the U.S. But Scottish officials claim that they have the advantage of a population trained in what historically have been engineering-oriented universities and technical colleges.

SDA also claims an advantage in having shifted its focus away from courting all foreign companies to lobbying the health care industry, oil companies and electronics firms.

While SDA itself does not offer grants to foreign investors, it does provide what it calls "one-door service," helping a foreign company find government financing of up to 22%, private funding and factory sites, said Colin Williamson, project administrator for LIS.

Prime industrial sites, which make SDA Scotland's biggest industrial landlord, are concentrated in Scotland's five new towns and selected development regions throughout a central belt stretching from southwest of Glasgow to the Kingdom of Fife, north of Edinburgh.

The new towns were established in farmlands throughout the UK after World War II, when the government wanted to shift the population from war-ravaged cities to suburbia.

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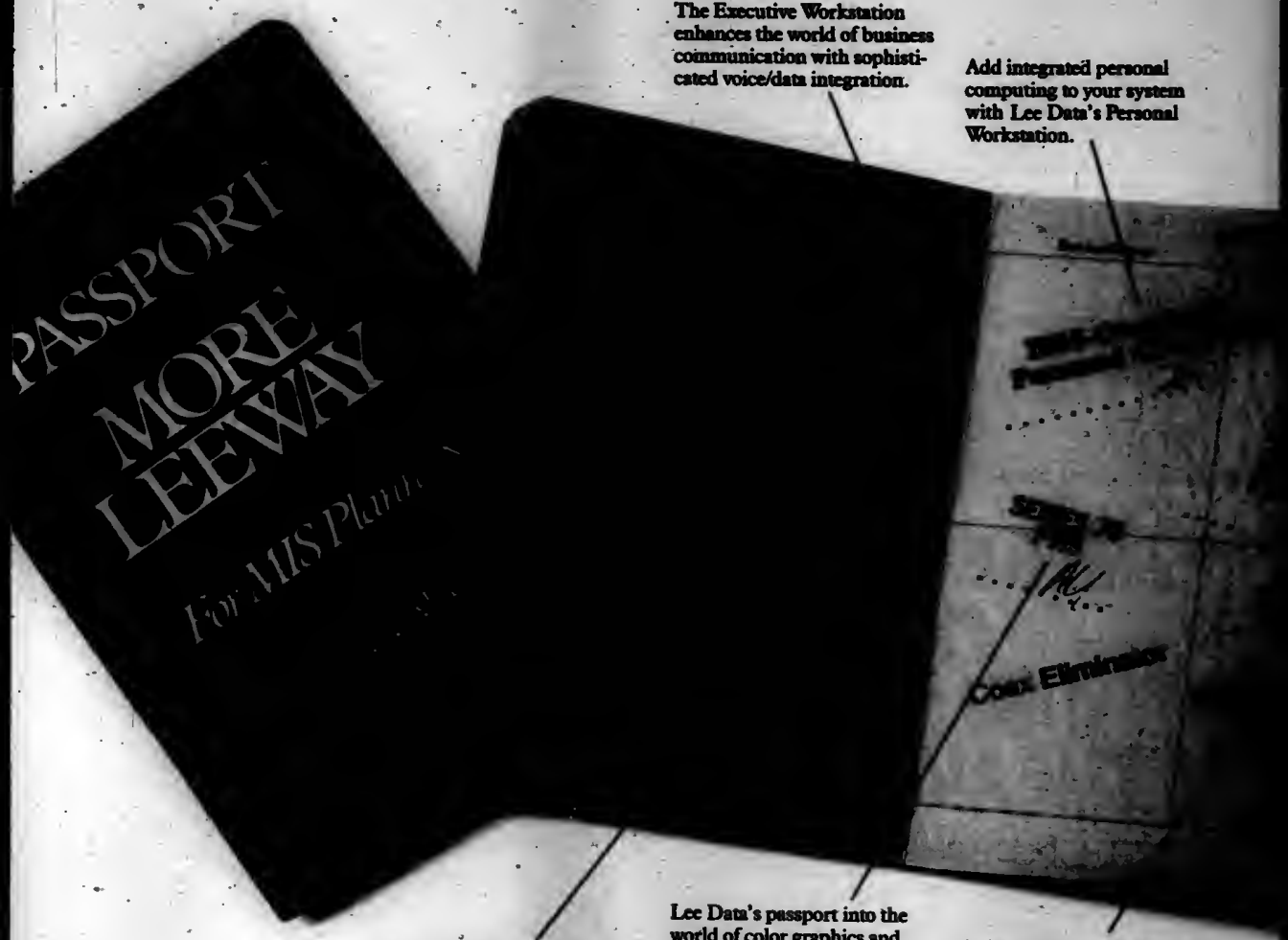

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Frank Giannantonio
Director of Information Services
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The ground rules were these:

The system would have to use personal computers as universal workstations, for professionals, managers, secretaries and administrative staff alike.

It would have to network the variety of computers made by other companies which Avon was already using.

It would have to be elegant both in physical design and in ease of use.

The one system that perfectly matched Avon's needs was Digital's VAX™ computer – the best-selling 32-bit computer in the world – with ALL-IN-1™ office management software.

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Frank Giannantonio explains. "The key was this: were we able to do more with this system than any other one? Would it let us communicate with our other systems better than any other one? And the answer both times was 'Yes.'"

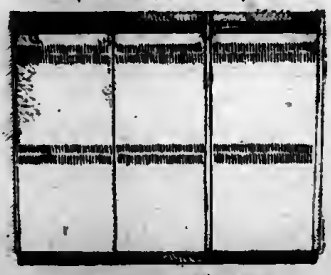
The 200-plus employees linked to the system at the Rye, N.Y., data processing headquarters have access to every function necessary to do their jobs effectively via a single workstation at each desk.

A plain English, menu-driven format appears on screen, so people can incorporate time-saving applications into their daily work routine. These include, among others, word processing, electronic mail, desk management tools and graphics.

Giannantonio elaborates. "You can come in in the morning, turn on your personal computer, and go right into the ALL-IN-1 system. From any of the various kinds of personal computers we use.

"The communications capabilities are very significant."

In addition to enormously enhanced individual communications capabilities, VAX computer



power makes a vast difference in the way people communicate with each other. For example, scheduling meetings.

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"You don't have to call up somebody and say, 'I'd like to reserve the conference room.' It gets done automatically. The secretary just keys it in, and checks the time against everyone's schedules."

"PRODUCTIVITY GAIN IS JUST ABOUT 53%."

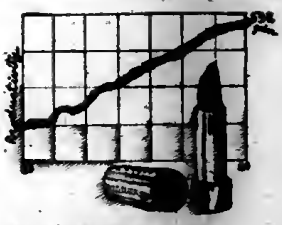
Menus and operating commands for these and other applications have been engineered in a consistent format, often requiring just two keystrokes to complete a function. Tasks can be performed without interruption. In preparing reports, for example, users can reference a chart on screen and then return directly to the report.

Not surprisingly, with fewer interruptions and immediate access to important information, the VAX system streamlines office efficiency.

To put it simply, Frank Giannantonio says, "People are becoming more productive."

Avon conducted a test to see just how much more.

Among professional and managerial personnel, productivity increased approximately 23 percent. Among secretarial



and administrative staff, the increase was even more dramatic, at 53 percent.

Those kinds of savings alone might have justified the cost of putting a VAX system to work for Avon. But there was more involved in the company's decision.

As Frank Giannantonio says, "We did not even consider the indirect savings from the productivity gain as cost justifications. They were added benefits.

"We used only the direct savings. And the direct savings amounted to a return on investment in one year.

"That's just about $1 million."

"I CAN QUICKLY GET INFORMATION TO PEOPLE – AND JUST AS QUICKLY GET IT BACK."

There are other savings that are harder to quantify. "Like the fact," Giannantonio says, "that now I get information sooner. Which means I can make decisions sooner. Information flows very quickly – very quickly."

Some Avon managers are connected to the VAX system from their homes. So if they've been away on a business trip or a vacation they can key into the system and know what's been happening even before they come back to the office. No more wasted time trying to catch up.

Time itself is being redefined. Through DECnet™ networking software, Avon plans in the very near future to link its Rye headquarters and domestic branches with its overseas offices. One of Avon's London managers was quick to see how a VAX computer could make the difference in time zones between his office and New York work to Avon's advantage.

"His first comment when he saw the system," says Giannantonio, "was 'I now have the opportunity to prepare a lot of information for New York during the first five hours I'm in, so that when you come in, you'll instantly know exactly what's happening in the European area.'

"Of course the same is true," Giannantonio adds, "in every one of our other locations.

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[illegible] Ltd. and Prestwick Circuits Ltd. were named to supply components for the IBM Personal Computer AT.

■ Apollo Computer, Inc. announced a 160-job assembly plant for its workstations in Livingston.

■ Digital Equipment Corp. is building a VLSI facility at the Ayr plant, where it now assembles PDP-11 minicomputers and microcomputers.

■ Harris Systems Ltd. announced a $3.6 million Irvine facility in which it will manufacture private branch exchanges.

■ Wang Laboratories, Inc. has begun shipments of word processors and minicomputers from its year-old Stirling plant.

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House, Senate compromise to devise microchip bill

By Mitch Betts
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Congress gave final approval last week to a compromise version of the Semiconductor Chip Protection Act, which will protect microchip designs from piracy for 10 years.

The legislation had broad support from the semiconductor industry and Congress [CW, June 25], but the House and Senate had taken different legal approaches to protecting the microchip "masks." House-Senate negotiations produced the compromise bill that was passed by the Senate on Oct. 3 and by the House of Representatives on Oct. 9.

"The result is a bill that breaks new ground by providing strong protection against the unauthorized copying of the design of [a] semiconductor chip," commented Sen. Charles McC. Mathias Jr. (R-Md.).

The final legislation provides special legal protection that is similar to copyright and which accords the owner of the chip design the exclusive right to make, import and distribute that design for 10 years, Mathias explained. The protection begins when the design is registered with the U.S. Copyright Office.

The compromise provides full protection for chips marketed after enactment of the bill; chips marketed after July 1, 1983, also receive the protection, but distribution of chip copies in existing inventories is permitted for a two-year period with payment of reasonable royalties.

The legislation does not explicitly protect chips designed before 1983, such as the 1982 generation of 16-bit microprocessors, but it states that any existing legal protection afforded those chip designs is retained.

Owners of chip masks can publicize the new protection by affixing the symbol "M" surrounded by a circle, or the words "mask work." Enforcement of the antipiracy legislation will be handled by private civil litigation in federal district courts, sponsors said, with a penalty of up to $250,000 in fines.

House-Senate negotiators last month reconciled the differences between the Senate bill, which was based on copyright law, and the House bill, which carved out new legal protection for microchips that is similar to copyright.

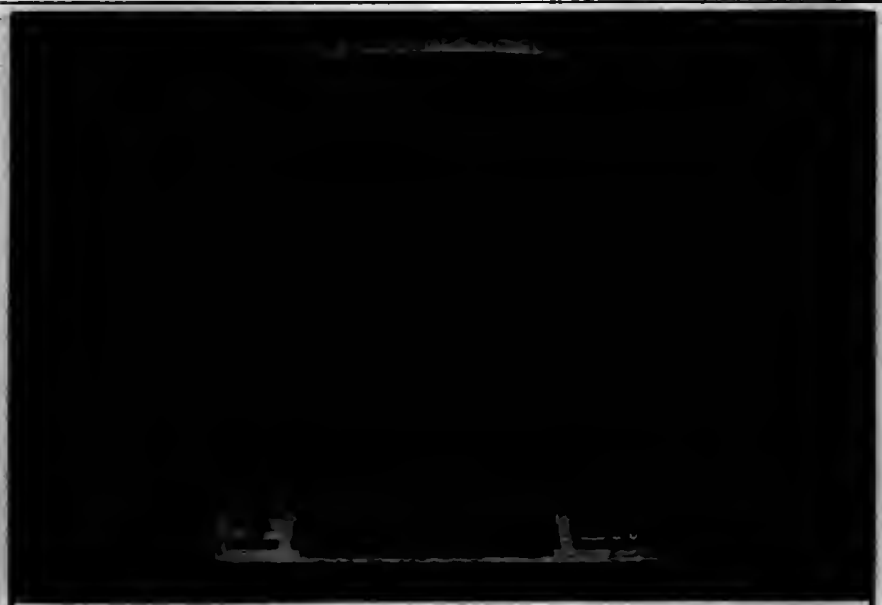
At the insistence of the House negotiators, who argued that microchips do not belong under copyright or patent law, the final bill creates a special legal protection called sui generis — a Latin phrase meaning "a thing unto itself" — for chip masks.

The legislation was generally supported by the electronics industry, including the Semiconductor Industry Association and the American Electronics Association (AEA). "We see it as important protection for something that, for a long time, has fallen through the cracks," commented William N. Bartolone, AEA's manager of government affairs.

"And, it proves that [Congress] sees that as the technology advances, the laws must be revised," he added.

In congressional hearings, electronics industry officials said the legislation is needed because overseas competitors can copy a family of microchips for about $100,000, while it costs the original developer about $80 million for R&D.

Paul G. Zurkowski, president of the Information Industry Association, said an important trait of the legislation is that it does not alter the traditional copyright protection given to the computer software and data bases that are stored in the chips.



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Government awards Zenith micro contract

GLENVIEW, Ill. — Zenith Data Systems Corp. said recently that it has received a $99.8 million federal contract for high-security personal computers.

Under the contract, said to be the largest of its kind ever awarded, Zenith will supply approximately 10,500 desktop systems to the U.S. Air Force, Navy and Marine Corps over a five-year period, the company said.

The microcomputers are versions of Zenith's Z-150 Personal Computer, modified to meet government Tempest security standards.

Two versions

Two versions will be supplied, one with dual 5¼-in. floppy disk drives and one with a floppy disk drive and a removable cartridge Winchester drive.

Tempest-tested color and monochrome monitors are included in the contract, according to Zenith.

The basic Z-150 was introduced last February and is said to be compatible with IBM Personal Computers.

In October 1983, the Air Force and Navy awarded Zenith a $29.3 million contract for the vendor's Z-100 computers.

Shipments for this earlier contract have exceeded the originally estimated quantities, Zenith said.

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COMPUTER INDUSTRY

Jobs cut as Dysan regroups

Seedling strategy seen spurring financial losses

By Kathleen Burton
CW West Coast Bureau

SANTA CLARA, Calif. — Dysan Corp. reportedly has laid off hundreds of workers as part of a major corporate retrenchment designed to curb its financial losses.

The *San Jose Mercury News*, San Jose, Calif., reported that 500 workers, most of them employed at Dysan's headquarters here, received layoff notices on Oct. 11 and 12. A spokeswoman for Dysan last week declined to confirm or deny the report.

On Oct. 9, the magnetic disk manufacturer announced plans to cut last year's $35 million research and development budget in half, halt construction of several new facilities, stop development on products peripheral to its basic product line and sell its interest in at least six affiliate companies, according to the company spokeswoman.

Dysan lost $15.8 million on sales of $52.1 million in the quarter that ended Aug. 4, and will sustain "a substantial write-off in the current quarter," the spokeswoman said.

Dysan's strategy of funding start-up magnetic media companies, coupled with the changing nature of its main line business, put the company in trouble, said John Lauritz, an analyst at Dataquest, Inc., a San Jose market research firm.

"With its seedling strategy, Dysan essentially became a venture capitalist, and venture capitalists don't always get winners," Lauritz said. He said Dysan's investments in affiliates were made to stimulate new technologies, enabling it to sell new proprietary products.

> *'With its seedling strategy, Dysan essentially became a venture capitalist, and venture capitalists don't always get winners,'* — John Lauritz, an analyst at Dataquest, Inc.

Dysan's seedling strategy began in 1979, and the company invested $7.1 million in its affiliates in 1981, $13.8 million in 1982, $18.9 million in 1983 and $21.2 million during the first nine months of fiscal year 1984.

According to market research analyst Bill Frank of San Jose-based Infocorp, some of the affiliates were successful — notably Seagate Technology, Inc., a Scotts Valley, Calif., disk drive maker that generated more than $300 million in sales after receiving Dysan financing.

But many Dysan affiliates floundered, he said, such as Applied Peripheral Systems, a disk drive maker in San Jose, Dastek Corp., a Los Gatos, Calif., manufacturer of magnetic disk heads and Westford, Mass.-based Tabor Corp., a 3½-in. disk drive manufacturer.

Dysan would like to sell its six nonprofitable affiliates, the Dysan spokeswoman said.

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COMPUTER INDUSTRY

Adapso loses Citicorp challenge

WASHINGTON, D.C. — The Association of Data Processing Service Organizations, Inc. (Adapso) recently lost a court challenge to Citicorp's establishment of a general-purpose data processing subsidiary.

The U.S. Court of Appeals here denied Adapso's appeal of a 1982 decision by the Federal Reserve Board, which granted Citicorp's application to form the Citishare subsidiary, and amended Regulation Y to expand the types of services bank holding companies can market publicly.

Jerome L. Dreyer, president of Adapso, said the association, which includes most of the leading independent data processing firms, will not further appeal the decision.

"When we began our challenges to bank involvement in computer services, the data processing and banking worlds were a lot different," Dreyer said. "Financial institutions seem to be undergoing a sort of de facto deregulation, and the entire atmosphere appears to be contrary to placing restrictions on financial institutions competing in other areas."

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AMD profits up 246% from 1983

SUNNYVALE, Calif. — Advanced Micro Devices, Inc. (AMD) recently reported second quarter profits of $42.1 million, or 72 cents per share, up 246% from the year earlier profits of $12.1 million, or 21 cents per share.

Sales revenues for the quarter ended Sept. 23 were $257 million, more than double the year earlier figure of $128.4 million.

With six-month revenues at $491.3 million, W. J. Sanders III, president and chief executive officer of AMD, said the company still expects to meet its fiscal year target of $1 billion in sales even though a boom in semiconductor industry orders in the first half of the year subsided when microcomputer vendors revised their shipment estimates downward.

HP, SBL collaborate

PALO ALTO, Calif. — Hewlett-Packard Co. and Santa Barbara Laboratories, Inc. (SBL) recently announced the signing of a letter of intent providing for technical collaboration. HP also agreed to acquire a minority equity position in SBL.

Under terms of the proposed relationship, HP will purchase and resell SBL's Centerpoint 1000 Executive Information System on an OEM basis. The parties said they predict that SBL products will be adapted to work with HP's office automation products.

Also under the arrangement, SBL will provide consulting services to HP, and SBL will be entitled to purchase HP equipment. Financial terms of the arrangement were not revealed.

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Lotus consents to settlement in 1-2-3 copying suit

By Christine McGeever
Special to CW‡

CAMBRIDGE, Mass. — Lotus Development Corp. will receive an undisclosed sum in settlement of a $1 million software-copying suit against Health Group, Inc. of Nashville.

While discussing the suit with Lotus, Health Group acknowledged that its employees had copied Lotus' 1-2-3 spreadsheet program, according to Lotus. Health Group refused to comment on any aspect of the suit.

Lotus charged in the suit that the hospital management firm copied the program without authorization. The suit was filed in U.S. District Court in Nashville on July 2 and was settled in August, according to Lotus attorney Bernard J. Bonn, a partner in the Boston law firm Testa, Hurwitz and Thibeault.

According to Lotus, Health Group officials said the company's managers were unaware that lower level employees were copying the program. Lotus said most cases of corporate unauthorized copying occur among lower level employees and added that those responsible for the copying were terminated. All unauthorized copies of 1-2-3 were destroyed and replaced with legitimate programs, Lotus said. Health Group employs 5,000 people.

Also as part of the settlement, Health Group is now subject to a consent decree that prohibits the company from "making or using unauthorized copies of the 1-2-3 program and related materials in the future."

"The settlement implies that if they [Health Group] are going to have multiple users, they are going to purchase multiple copies," said Lotus President Mitchell D. Kapor.

Prompt corrective measures

Health Group, he added, took prompt corrective measures. Kapor said that Health Group tried to stop the copying before Lotus sued.

Lotus filed a similar suit in early 1984 against Rixon, Inc., a Silver Spring, Md. data communications firm that manufactures products for mainframes and minicomputers.

The $10 million suit was considered a test case because it was the first that sought damages against a company for copying software for internal use.

The suit charged that Rixon distributed 13 unauthorized copies of 1-2-3 to its domestic branch offices. The suit ended with a similar court-ordered consent decree and a settlement of an undisclosed sum.

McGeever is a reporter for Infoworld, *a Menlo Park, Calif.-based personal computing weekly.*

Lotus names chairman, chief exec

CAMBRIDGE, Mass. — Lotus Development Corp. recently named cofounder Mitchell D. Kapor to the new positions of chairman and chief executive officer.

Kapor, who has been president of the business software firm since 1982, will be succeeded in that job by Jim P. Manzi, currently vice-president of marketing and sales.

"These new positions anticipate the needs and challenges of the organization as it grows to a large company and are logical and natural changes," Kapor said.

"This new division of responsibilities between Jim Manzi and me will allow me to focus on Lotus' strategic and product development direction," Kapor said. "Jim will have specific responsibility for managing the company's daily activities."

Manzi used to work as a management consultant for McKinsey & Co. in New York.

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COMPUTER INDUSTRY

U.S. R&D, production sites mark Epson market refocus

By Jeffry Beeler
CW West Coast Bureau

TORRANCE, Calif. — A Japanese supplier of personal computer systems and peripherals has launched a new phase in its American marketing strategy by announcing plans to establish its first three U.S.-based research and production facilities.

During an Oct. 10 press conference at the headquarters of his company's U.S. subsidiary, Epson Corp. chairman Ichiro Hattori announced the official opening of a research and development center already employing 50 people in Palo Alto, Calif. Hattori also disclosed his company's plans to form a software development company in neighboring Mountain View and a 100,000-sq-ft manufacturing plant outside Portland, Ore., where Epson will produce dot matrix printers for U.S. use.

Together, the three facilities mark the first time in its history that Epson will develop and manufacture products inside the U.S. In the past, all the firm's hardware and software production activities have been centralized in Japan, although its U.S. marketing efforts have long been conducted through its U.S. subsidiary, Epson America, Inc.

Epson's Palo Alto-based R&D center, the Advanced Products Division, will "research and evaluate long-range hardware and software needs in the American market," Hattori said. "This research will have a strong influence on future products built by Epson in the U.S. and Japan." In addition to monitoring U.S. computer industry trends, the center will define new products for Epson and often will design their prototypes.

By contrast, the company's first U.S.-based software development facility, Ascent, Inc., will write business application packages for Epson's desktop and portable personal computer families, Hattori said. Ascent is also expected to modify its parent company's existing software to operate on competitive microcomputers.

The Oregon manufacturing plant, meanwhile, "will make Epson that much more a part of the American community," Hattori said. "It will also give Epson America more local control over its products and the greater capacity and shorter lead-times that come with local production."

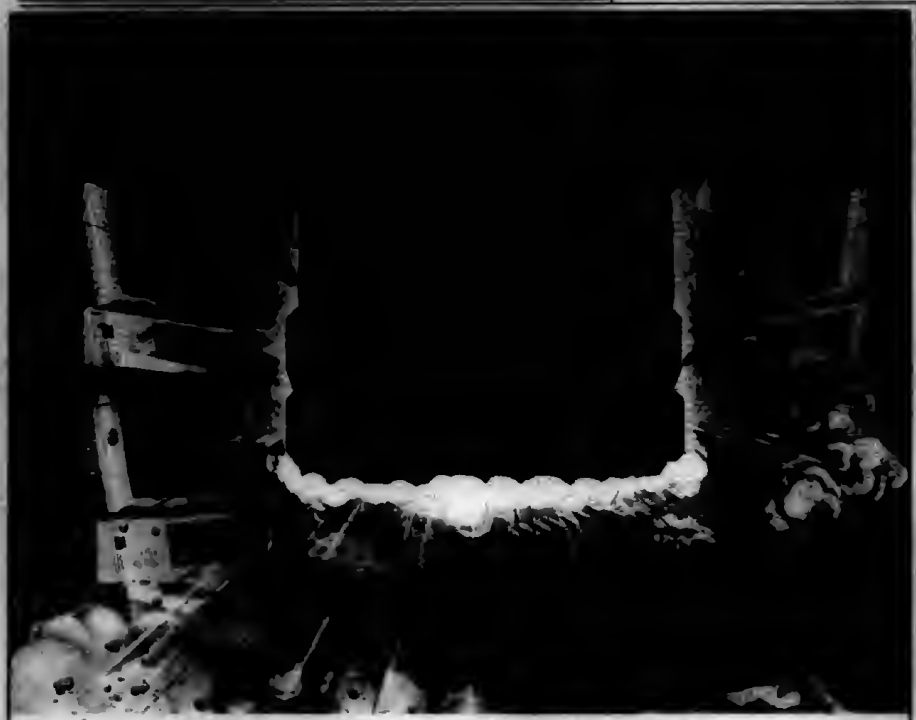
Scheduled to start production sometime next year, the Oregon plant will be joined in the future by a second U.S.-based manufacturing site, which will produce Epson personal computers, Hattori said.

For Epson, the benefits of forming the three domestic installations are threefold: proximity to target markets, access to Silicon Valley technology and an expanded software repertoire, said Jack Whalen, Epson America's executive vice-president.

Far from signaling an abrupt shift in the Japanese vendor's marketing strategy, the emergence of the three domestic organizations is merely an evolutionary step toward Epson America's ultimate goal of becoming "a complete, vertically integrated U.S. company," Whalen said.

Although Epson is probably best known for its dot matrix printers, the company also produces a line of microcomputer systems, including the desktop Model QX-10 and the Geneva, a portable introduced in July. The firm's personal computer family also includes the QX-16, which made its debut Oct. 10 and supports both CP/M and MS-DOS.

At present, Epson's microcomputer systems are aimed primarily at consumers and users in small businesses. "But we feel we have an imperative to establish a presence in large corporations," Whalen said.



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COMPUTER INDUSTRY

Update on high-tech waste seen needed in Bay State

By John Desmond
CW Staff

BOSTON — Massachusetts is not keeping reliable and up-to-date records of hazardous waste generation and disposal by high-technology companies, according to a report released recently by the Task Force on High-Tech Toxics.

The task force report was written by Kenneth Geiser, an assistant professor of urban and environmental policy at Tufts University; Rand Wilson, an organizer for the Communications Workers of America; Richard Bird, technical assistance director of the National Campaign Against Toxic Hazards; and Leslie Kochan, a research associate for the Clean Water Action project. The most recent comprehensive report on high-tech hazardous waste generation was done in 1976 by GCA Corp. at the request of Massachusetts water pollution control authorities, the task force found. That GCA study estimated that industries classified as high-tech produced 2.7 million gallons of hazardous waste per year, or 12.9% of the state's total production.

The task force report called this estimate "seriously out-of-date" and limited to a small sample of firms. A more recent update by GCA estimated that in 1983 the state's high-tech industry generated 20.2% of the state's total hazardous waste.

A 1983 collaborative study by groups including the Associated Industries of Massachusetts and the Massachusetts Audubon Society found that only five of the state's 35 semiconductor firms were filing the annual reports on waste generation required by state law. As evidence of poor waste disposal practices, the task force report listed several high-tech firms that have been contributors to sites cleaned up with money from the Environmental Protection Agency Superfund.

These included Raytheon Corp. and Digital Equipment Corp., which contributed to the cleanup of a toxic waste site in Lowell, Mass., the report stated.

The report quoted a Massachusetts Department of Environmental Management official, who had estimated that 50,000 tons of hazardous waste annually are flushed down sewer pipes and not treated. Reports on groundwater pollution from a high-tech industrial park in Burlington, Mass., found corroded lines leading from some of the high-tech plants, indicating that "corrosive chemicals were dumped into the lines," according to the report.

Data base needed

The report recommended that Massachusetts commission a comprehensive report on toxic chemical use, waste generation and related health consequences. "Without such a data base and periodic updates, neither those involved in managing high-tech firms nor those who are concerned . . . can confidently estimate the serious risks involved," the report asserted.

Christopher Anderson, a spokesman for the Massachusetts High-Technology Council, concurred with the estimate that companies in the field are producing 20% of the hazardous waste generated statewide, and he supported the thrust of the task force report. "Anytime an attempt is made to raise public awareness, that is good," he said of the issue.

But at present, Massachusetts has no hazardous waste dumping site. "The state needs a place to site [dump] this material correctly," he said, adding that the industry has offered to consider for new or expanded high-tech plants communities willing to host a hazardous waste disposal site.

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LESSORS from page 101

earned one of the top positions in the industry, and that status is what the CDLA attempted to address in its recent annual meeting.

Should IBM Credit participate in the CDLA's electronic trading net, and should IBM Credit and similar captive credit corporations be encouraged to seek membership in CDLA? CDLA members do not want to give IBM Credit any more of an edge, but they also do not want to cause IBM Credit to go out and establish separate market channels over which it would have total control.

IBM Credit is presently the only captive credit corporation that threatens the health and sanity of third-party dealers and lessors, although AT&T's expected entry could add a different dynamic. It has been widely claimed that IBM salesmen receive financial awards to steer business to IBM Credit, although some third-party participants claim the salesmen are going to benefit whether the user leases through IBM Credit or an independent.

Growing 30% annually

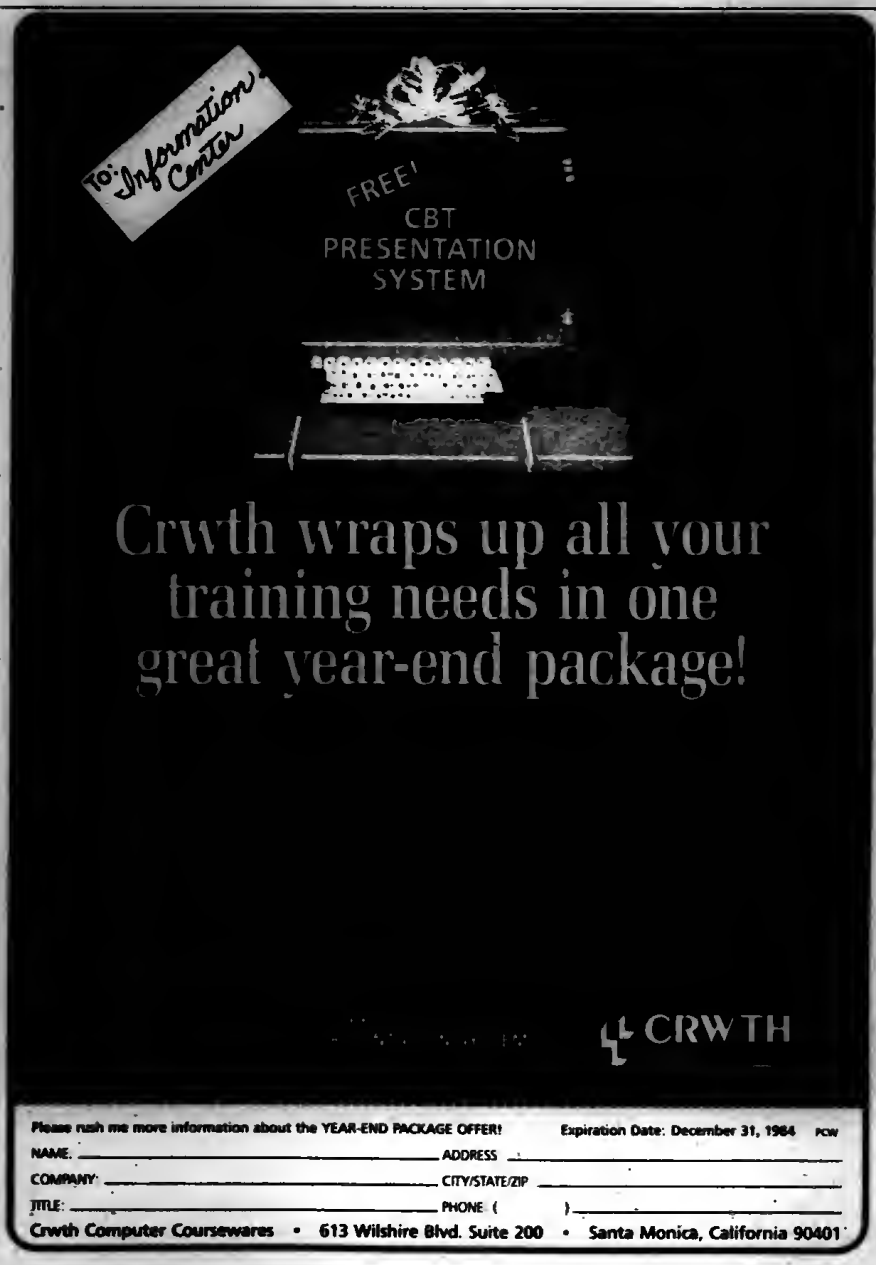
And IBM Credit is certainly leasing a lot of machines, if the $100 million-a-month figure is accurate, but it is not yet enough to blunt a third-party market that is heavily focused on IBM equipment and is growing at an annual rate of better than 30%.

But at some point, the equipment that IBM Credit has put out on 36-month leases is going to come back into the market for resale. That process will begin next year as IBM Credit's first leases expire, but it will really pick up steam the following year and after.

In the leasing business, much of the profits are made when the equipment leases expire; the equipment — after being largely paid off by lease payments, investment tax credits and depreciation credits — is then reconditioned and sold as a used machine.

The question troubling many CDLA members is what is going to happen to the used equipment market when IBM Credit starts flooding that market. Many question IBM Credit's ability to remarket used machines, and some third-party participants have even questioned certain economic policies upon which IBM Credit is presently basing its lease rates. But as IBM has shown many times over the years — even more dramatically over the past two years — it follows very few loping propositions.

Even though the third-party market is growing at a rate almost double that of the computer industry in general, the fear that IBM Credit could be as successful in the used market as it is presently in the leasing market is very troubling to CDLA members. They may not want to play ball with IBM Credit, but they also do not want to play in a totally different league.



DEFENSE from page 101

national Corp.; United Technologies Communications Co.; McDonnell Douglas Astronautics Co.; GTE Government Systems Corp.; and Rockwell International Corp.

"The need for such a joint effort became recognized as one way to stop the escalating cost of software developed for the Department of Defense," said V. Edward Jones, a TRW executive who will serve as director of the executive committee studying the plan.

Jones noted that the cost of software development has been rising, while hardware development costs have been declining. "A joint research effort may reduce these costs and solve the problem of efficiently producing complex software systems for the Department of Defense and remaining competitive with foreign competition," he said.

Similar joint ventures have already been formed — among them the Microelectronics and Computer Technology Corp., a 19-company consortium based in Austin, Texas. The U.S. Department of Justice has permitted that venture to proceed, although it has raised some questions about joint research and development efforts by competing firms.

Antitrust liability reduced

Last month, the U.S. Congress approved legislation that reduces the antitrust liability for joint research ventures by high-technology firms. Edie Cartwright, spokeswoman for TRW, declined to say whether there was a connection between announcement of the consortium plan and Congress' action. She said the companies have been discussing the idea since early this year.

The initial planning site will be a TRW facility here.

Each of the participating companies is putting up $50,000 to fund the project through the planning stage. It has yet to be determined how much money would be needed if the consortium was chartered, according to Cartwright.

The planning will involve working out business, financial, legal and technical arrangements. The group will also consider where to locate a permanent site. Some of the criteria for site selection will be the availability of computer professionals, support from local educational institutions and governments, as well as factors such as living costs, community interest and quality of life.

COMPUTER INDUSTRY

Shugart reduces work force, cites stiff market competition

SUNNYVALE, Calif. — Shugart Corp., a Silicon Valley disk drive maker, last week announced plans to lay off 230 nonproduction employees in response to deteriorating profit margins.

"The disk drive market is very tough, and we have to reduce our overhead expenses," said Shugart President William Bayer. "We're having a margin, not a shipping volume, problem though," he said, claiming that last month's shipping volume reached an all-time high.

Bayer said competition in the disk drive marketplace has caused prices to drop and margins to decay. "There are 70 or 80 companies in this business, and there's only room for 10 or 15," he said.

Some industry analysts have blamed a soft personal computer market for the slump in the disk drive industry, but Bayer disagreed, claiming that the market is "in correction following an oversupply. The [personal computer] market will be back up by Christmas."

Shugart, which reportedly posted a $50 million loss last year, has reduced its work force by 1,000, largely through attrition. The company now employs about 1,800 persons in California, Mexico and Europe.

Once the world leader in floppy disk drive production, Shugart began to lose market share in mid-1982, when 5¼-in. disks replaced 8-in. disks as the industry standard, analysts said.

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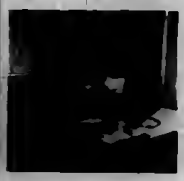

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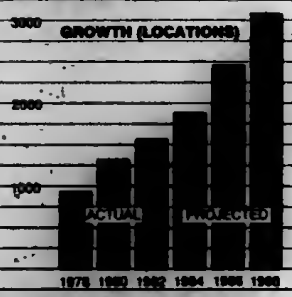

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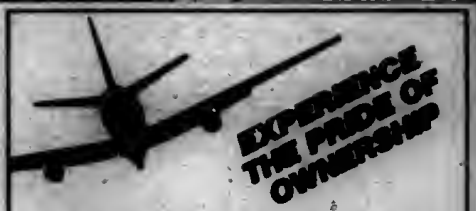

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This key position requires a degreed individual (Mathematics or Computer Science) possessing a minimum of 6 years data processing involving operations, systems programming, and performance analysis. A background to include a working knowledge of SAS, RMF, and PMR; experience in hardware configuration, and performance analysis of large CICS and MVS systems are essential.

Data Base Specialist

The professional we seek must possess a minimum of 2 years in a data base administration group and extensive experience in ALC and CICS internals. A background to include knowledge of UCC 10 and/or Intertest helpful.

Programmer Analyst

Selected candidate will be degreed (Mathematics or Computer Science) and possess a minimum 4 years maintenance and development experience using extensive COBOL. Experience with financial and on-line systems are essential; knowledge of report writer (SAS) would be a plus.

These challenging positions offer a salary commensurate with ability and experience as well as an excellent compensation package. Qualified applicants are encouraged to forward credentials with salary history, in complete confidence to: Manager of Support Services, Sisters of Charity Health Care System, 6400 Lawndale, Houston, Texas 77023. Principals only. An equal opportunity employer.

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Regional Manager: Computer Maintenance.
This person will manage our maintenance operations in our Midwest region. Experience in maintenance management is required, preferably with involvement in data centers. Residency in the Minneapolis area will be required.
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National Manager: Computer Maintenance.
This person will manage our data center maintenance operations in the U.S. Experience in maintenance management is required, preferably with involvement in data centers. Residency in the Minneapolis area will be required. Duties will also include providing assistance to the vice president of field engineering.
Salary range: $42,000 to $55,000 annually.

Dataserv will have additional openings soon for experienced Field Engineers and technical specialists in major cities throughout the United States. If you're considering a change, contact Dataserv for a review of our company and your career goals.

For immediate confidential consideration call 612-933-8575 or TOLL FREE - 800-328-6729 or send resume to: R.A. Wellers, Dataserv Computer Maintenance, Inc., P.O. Box 3008, Hopkins, MN 55343.

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POSITION ANNOUNCEMENTS

Security Kernel Development and Verification

We are looking for several experienced technical people to contribute to the development and formal verification of a new security kernel—a Trusted Computing Base that will be a candidate for a Class A1 evaluation from the DoD Computer Security Center.

To be considered for the **verification positions** you should have experience with one or more existing kernel specification languages (SPECIAL or Ina Jo*) and with the use of formal tools to verify that a specification is consistent with an information flow (lattice) security model. More important, you should want to apply your experience to the specification and verification of a real security Kernel product.

To be considered for the **development positions**, you should have experience in operating system design and implementation, and should be familiar with or willing to learn about layered operating system structures and the techniques of secure system design. We believe that candidates for the developer positions should have a degree in computer science or sufficient equivalent background and experience to understand the principles underlying secure system design.

The emphasis of our group is development, not research. We have a running prototype Kernel in hand, and the members of our development group have completed initial training in formal specification techniques and language. We intend to apply the concepts of secure system design and verification to build real secure system products that can have an impact in the marketplace.

We are located in the suburbs of Boston. Interested candidates should send their resume to CW-B4086, Computerworld, Box 880, Framingham, MA 01701.

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G.D. Searle Research and Development Division, located in north suburban Chicago, has an outstanding opportunity for an individual with 1-3 years programming experience in FORTRAN or PL/1.

The qualified individual must have an in-depth knowledge of IBM VM/CMS and possess a BS or MS in Computer Science or a related field. A familiarity with the SAS statistical package is desired.

Responsibilities include not only statistical programming, but also assisting in the operation of an IBM compatible mini-computer.

Searle R&D offers an excellent salary, benefits package and relocation assistance. To apply in confidence, send resume including salary requirements to:

Barbara Gardner / #3AX — 5
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The Department of Computer Science of the University of Wisconsin Oshkosh invites applications for full-time positions to the rank of instructor: one or two openings for January 1985 and one or two openings for September 1985. A normal 12-hour load will be teaching three undergraduate courses per semester and supervising tutors and student assistants. The minimum qualification for an appointment is a Master's degree in Computer Science.

Interviews for the September 1985 openings will be conducted at CSC '85 in New Orleans, March 12-14, 1985. Screening of applications will begin November 1, 1984 and will be carried out continuously until the positions are filled. Applications should include a résumé, transcripts and three letters of reference with the letter of application.

Send applications to: Wayne Wallace, Chairman, Computer Science Department, University of Wisconsin Oshkosh, Oshkosh, Wisconsin 54901. The University of Wisconsin Oshkosh is an Equal Opportunity, Affirmative Action Employer.

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IBM COMMUNICATIONS SPECIALIST - Position requires a minimum of three (3) years experience in installing and maintaining ACF/VTAM and ACF/NCP with bi-sync and SDLC devices. Must be proficient in assembler language coding, network planning and debugging.

HARDWARE - IBM 3081, NAS 9070, 3725, 3274, 3705
SOFTWARE - MVS/SP1, ACF/NCP, ACF/VTAM, MSNF

IBM DB2/VS SYSTEMS AND DATA BASE SPECIALIST - Positions require minimum of three (3) years experience in installation and maintenance of IMS DB/DC products and technical support. Data Base design, control, and problem resolution are desired capabilities.

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This is a Senior level position involving hands-on design and supervisory responsibilities. Qualified applicants will possess 5 years DBMS and RSX work experience using Fortran or Pascal, and a BS (MS) in EE (CS) or 5 years Intel 8080, 8741 with PL/M, C, or Forth.

American Dade Chemistry Systems offers competitive salaries, excellent benefits, and the professional satisfaction of working with an industry leader. For immediate consideration, please forward your resume, indicating desired position, with salary history to: B. Carter, Personnel Director, American Dade Chemistry Systems, Division of American Hospital Supply Corporation, 340 Clinton Street, Costa Mesa CA USA 92626. We are an equal opportunity employer m/f/h.

American Dade Chemistry Systems

The Department of Computer Science of the University of Wisconsin-Oshkosh invites applications for full-time tenure track positions at the rank of Assistant or Associate Professor. One opening for January 1985 and one opening for September 1985. A normal 12-hour teaching load will for three courses per semester. The minimum qualifications for an appointment to a Ph.D degree in Computer Science or a Master's degree in Computer Science with a Ph.D. in some other discipline. Teaching is emphasized, professional activity is required of all tenure-track positions.

The Department offers a B.S./B.A. degree. Courses currently offered include data structures, architecture, artificial intelligence, programming languages, simulation, graphics, database, operating systems, compiler construction, software systems, theory of computing and various courses. On-campus computer facilities for academic use include a VAX 11/780, an IBM 4341 and two PDP-11/70's. Currently there are 300 Computer Science majors; there are approximately 11,000 students on campus. The University has a $300,000 fund which is used to support research faculty. There are opportunities for consulting with local industries.

Interviews for the September 1985 opening will be conducted at CSC '85 in New Orleans, March 12-14, 1985. Screening of applications will begin on November 1, 1984 and will for ward and continuously until the positions are filled. Applications should include a resume, transcripts and three letters of reference with the letter of application. Send applications to: Wayne Walker, Chairman, Computer Science Department, University of Wisconsin-Oshkosh, Oshkosh, Wisconsin 54901. The University of Wisconsin-Oshkosh is an Equal Opportunity, Affirmative Action Employer.

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- management of systems development projects
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- university degree required

OPERATIONS MANAGER
- 4 years experience in computer operations
- management of IBM 4341 computer systems
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VANGUARD
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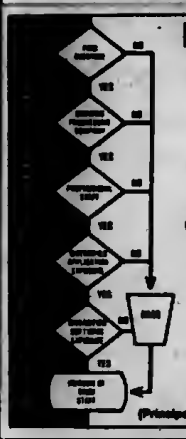

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Upcoming SoftFairs: Los Angeles, Jan. 21 & 22; Atlanta, Jan. 28 & 29; Chicago, Feb. 4 & 5; New York, Feb. 11 & 12; and Philadelphia, Feb. 25 & 26.

data processing

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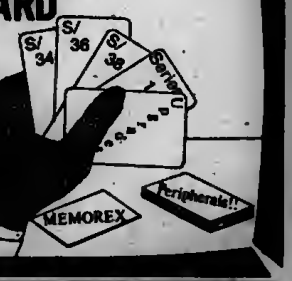

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Request for Proposal No. 950, due 3:30 p.m., Tuesday, November 20, 1984 for the purchase of a spreadsheet software package to run on a Honeywell DPS 6/36 system for the Mississippi Department of Energy and Transportation, Jackson, MS.

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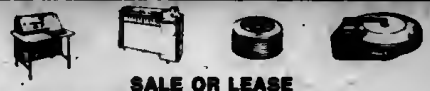

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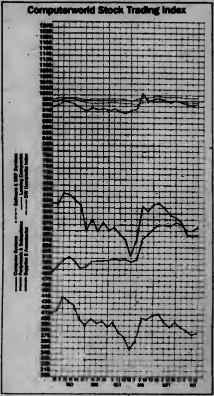

Computerworld Stock Trading Summary

All statistics compiled, computed and formatted by TRADE QUOTES INC, Cambridge, Mass. 02139

CLOSING PRICES WEDNESDAY, OCTOBER 17, 1984

COMPUTER SYSTEMS

E X C H	Company	1983-84 Range (1)	Close Oct 17 1984	Week Net Change	Week Pct Change
O	ALPHA MICROSYSTEMS	8- 20	8 1/8	- 1/8	-3.0
O	ALTOS COMPUTER CORP	6- 21	8 1/2	+ 3/8	+4.1
O	AMDAHL CORP	10- 30	10 7/8	- 1/8	-1.1
O	APPLE COMPUTER INC	19- 33	24 7/8	+1	+4.1
N	[illegible]	19- 21	42 3/8	+ 1/2	+0.0
N	BURROUGHS CORP	39- 38	30 7/8	+1 7/8	+0.0
O	COMPAQ COMPUTER CO	4- 10	4 7/8	+ 0/8	+20.7
O	COMPUTER AUTOMATION	3- 17	5 3/8	+ 1/8	+2.3
O	COMPUTER CONSOLES	10- 20	10 1/2	-3	-22.0
N	CONTROL DATA CORP	20- 62	30 1/2	+ 3/8	+1.0
O	CONVERGENT TECHNOL	6- 41	7 3/8	-3 1/2	-31.1
N	CRAY RESEARCH INC	30- 30	60 3/8	+1 7/8	+3.0
N	DAISY SYSTEMS CORP	14- 35	20	+1 3/8	+7.3
N	DATA GENERAL CORP	27- 30	53 7/8	+2 1/2	+0.0
N	DATAPOINT CORP	14- 31	14 1/2	- 3/8	-2.0
N	DIGITAL EQUIPMENT	29-123	60 3/8	+1 1/4	+1.3
A	[illegible] INC	10- 00	13 3/8	0	0.0
O	ELECTRONIC ASSOC.	0- 10	3 1/8	- 1/2	-12.0
O	FLOATING POINT SYST	10- 00	18	+ 3/4	+4.0
O	FORTUNE	20- 47	30 1/4	-1 1/4	-4.0
O	GENERAL AUTOMATION	0- 10	0 3/4	-1 3/4	-23.0
O	GOULD INC	21- 46	21 5/8	-2 1/2	[illegible]
*	GRAPHIC CORP	20- 40	30	+ 3/8	+1.6
O	HEWLETT-PACKARD CO	31- 30	30 3/8	+ 1/8	+1.0
N	HONEYWELL INC	30- 30	30 1/8	+ 1/4	-0.0
N	IBM	103-134	121 7/8	0	0.0
O	IPL SYSTEMS INC	0- 10	2 3/4	+ 1/8	+0.7
N	ITT CORP	22- 47	28 3/8	-1 3/8	-4.0
O	M/A-COM INC	10- 30	10 1/8	+ 3/4	+4.2
O	MANAGEMENT ASSIST	0- 30	27 1/8	- 3/4	-1.0
O	MATSUSHITA ELEC(ADR)	20- 30	00 1/8	- 1/4	-0.0
O	MODULAR COMPUTER SYS	0- 10	7	-1	-12.5
O	[illegible]	0- 17	10 3/8	+ 3/4	+0.0
O	MOTOROLA INC	20- 30	00 3/8	-1 1/8	-0.1
O	NAT'L SEMICONDUCTOR	11- 30	32 3/4	- 3/8	-4.0
O	NBI INC	17- 00	17 3/4	+ 3/8	+1.0
O	NCR	22- 00	24 0/2	+ 3/4	+3.1
O	PERKIN-ELMER	10- 30	20 7/8	+ 3/8	+0.0
O	PRIME COMPUTER INC	11- 00	10 3/8	+ 7/8	+0.0
O	SPERRY CORP	30- 30	30	+ 1/4	+0.0
O	STRATUS COMPUTER INC	0- 17	0 3/8	+1	+01.4
O	TANDEM COMPUTERS INC	10- 30	17 0/8	+ 3/8	+0.0
O	TANDY CORP	20- 02	23 1/8	- 1/2	-1.0
O	TELEVIDEO SYSTEMS	0- /3	6	- 1/8	-0.0
O	[illegible]	0- 17	10 1/8	+ 3/8	+2.5
N	TEXAS INSTRUMENTS	101-100	120	- 3/8	-0.2
O	ULTIMATE CORP	13- 20	30 7/8	+2 3/8	+12.0
O	WANG LABS "B"	0- 0	3/8	+ 1/8	+00.0
O	WANG LABS "C"	20- /0	30	+1	+4.0
O	[illegible]	24- 30	30 3/8	+1 3/4	+0.4
O	XEROX CORP	30- 30	30 7/8	+1	-2.0

LEASING COMPANIES

E X C H	Company	1983-84 Range (1)	Close Oct 17 1984	Week Net Change	Week Pct Change
O	[illegible] FINANCIAL GP	10- 30	30 1/8	+ 1/8	+0.0
O	CRI CORP	0- 10	0	+ 1/8	+1.0
O	COMDISCO INC	10- 42	11 3/4	+ 1/4	+3.1
O	CONTINENTAL INFO SYS	3- 10	0 1/2	+ 3/4	+10.0
O	DPF INC	10- 10	10 3/8	[illegible]	0.0
O	PHOENIX LEASING INC	9- 17	3 3/8	+ 1/8	+10.0
O	SELECTERM INC	11- 21	13 1/4	+1 3/4	-12.0
O	U.S. LEASING	30- 44	30	+ 3/8	+1.0

COMPONENTS

E X C H	Company	1983-84 Range (1)	Close Oct 17 1984	Week Net Change	Week Pct Change
O	ADVANCED MICRO DEV	20- 41	26 3/8	+1	-3.0
O	ADV'D SEMICONDUCTOR	10- 30	10 1/4	+1 3/4	+10.0
O	ANALOG DEVICES INC	20- 30	30	+1 1/4	+5.4
O	ANALOGIC CORP	10- 31	10	0	0.0
O	APPLIED MAGNETICS CP	0- 37	8 0/2	0	0.0
O	[illegible] CORP	0- 10	0	-1 1/8	-30.0
O	[illegible] CORP INC	10- 10	10 3/8	+ 1/8	+1.2
O	TERADYNE	20- 00	30 1/8	+2 1/8	+10.0

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SOFTWARE & EDP SERVICES

E X C H	Company	1983-84 Range (1)	Close Oct 17 1984	Week Net Change	Week Pct Change
O	ADVANCED COMP TECH	2- 8	2 1/2	- 1/8	-5.0
O	ADVANCED SYSTEMS INC	10- 20	12 7/8	- 1/8	-0.7
O	AGS COMPUTERS INC	11- 20	13 1/4	+1	+8.1
O	AMERICAN SOFTWARE	10- 01	16 6/8	- 3/4	-3.0
O	ANACOMP INC	2- 20	0	+ 3/8	+60.0
O	[illegible] INTL CORP	0- 17	8	+ 3/4	+14.0
O	APPLIED DATA RES	10- 31	24 3/8	- 3/8	-1.3
O	[illegible]	0- 10	8 1/2	+ 3/4	+0.0
O	BRC COMPUTER SYSTEMS	13- 22	19 3/4	- 1/8	+0.7
O	[illegible] CORP INC	1- 7	1 3/8	0	0.0
N	AUTOMATIC DATA PROC	30- 46	30 3/4	+1	+2.7
O	[illegible] COMPUTER [illegible]	0- 17	12 5/8	+ 1/8	+0.0
O	COMPUTER [illegible] INC	15- 30	17 1/8	+1 1/2	+0.3
O	COMPUTER [illegible]	0- 20	8 3/8	- 3/8	-2.1
O	COMPUTER [illegible]	0- 11	7 1/8	0	0.0
O	COMPUTER [illegible]	10- 23	12 7/8	0	0.0
O	COMPUTER TASK GROUP	10- 10	10	- 1/8	-1.3
O	COMPUTER [illegible]	0- 10	7 1/8	- 3/8	-4.7
O	COMPUTER SYSTEMS	4- 23	8 1/4	+ 3/8	+10.1
O	COMSHARE CORP	7- 30	8 1/8	- 1/8	-0.1
O	COMSHARE	9- 14	7 3/4	0	0.0
O	CULLINET SOFTWARE	20- 30	00	+3	+7.3
O	CYCARE SYSTEMS INC	10- 30	18 3/4	+ 3/8	+2.0
O	ELECTRONIC DATA CORP	20- 40	30	+1 7/8	-0.0
O	[illegible] SYSTEM INC	10- 27	11 1/8	+ 3/4	+7.1
O	GENERAL ELECTRIC CO	00- 30	30 1/8	+1 3/4	+3.1
O	GTE CORP	30- 30	40 3/4	+1	+0.3
O	INFORMATION GENERAL	10- 30	10	+ 3/8	+1.0
O	INFORMATION SCIENCE	0- 17	8 1/8	0	0.0
O	INTERTRON SYSTEMS CO	20- 30	20 1/8	-1 1/8	-3.0
O	[illegible] ASSOCIATES	3- 10	12	0	0.0
O	[illegible]	10- 30	30	+ 1/8	+0.0
O	LOTUS DEVELOPMENT CO	10- 30	30 1/8	+ 1/8	+0.0
O	[illegible]	3- 30	7 3/4	+ 3/8	+0.7
O	[illegible] CORP INC	0- 30	8 1/4	+1 1/4	+11.0
O	MATHEMATICAL APP GRP	0- 30	8	0	0.0
O	MICRO [illegible] INC	20- 00	20 1/8	+ 1/8	+1.4
O	[illegible] INT'L CO	2- 10	0 3/4	+ 1/8	+4.0
O	[illegible] GROUP CP	0- 23	16 3/4	+ 1/8	+0.0
O	[illegible] CORP CORP	2- 30	10	+1 3/8	+00.0
O	ON-LINE SOFTWARE INT	0- 20	0	0	0.0
O	PANSOPHIC SYSTEMS	10- 30	11 1/8	- 3/8	-0.2
O	PLANNING RESEARCH	10- 21	10 1/8	-1 3/4	-10.3
O	POLICY MGMT SYSTS CO	20- 30	20 1/2	- 1/8	-1.0
O	PROGRAMMING & SYS	4- 8	4 1/8	- 1/8	-0.7
O	REYNOLDS & REYNOLDS	30- 00	30	- 1/8	-0.8
O	SEI CORP	11- 00	11 0/2	+ 1/8	+2.2
O	SHARED MEDICAL SYST	20- 42	27	+ 1/8	+0.0
O	SCIENTIFIC COMPUTERS	3- 14	10 1/8	- 3/8	-0.0
O	SOFTWARE AG	0- 10	10	+ 1/8	+1.0
O	SYS CORP	10- 15	13 3/4	- 1/8	-1.0
O	[illegible]	7- 17	11	+ 3/8	+0.0

PERIPHERALS & SUBSYSTEMS

E X C H	Company	1983-84 Range (1)	Close Oct 17 1984	Week Net Change	Week Pct Change
O	AD INTERNATIONAL	0- 7	3 1/8	0	0.0
O	[illegible]	0- 30	0	+ 1/8	+0.0
O	AUTO-TROL TECHNOLOGY	10- 30	10 1/8	- 1/8	-0.0
O	[illegible] COMPUTER	10- 30	10	-1 3/4	-0.1
O	[illegible] INC	0- 22	0 3/8	+1 1/2	+20.0
O	[illegible] INT'L	3- 10	3/8	0	0.0
O	[illegible] & [illegible]	17- 30	21	+1	+0.0
O	CAMBEX CORP	1- 8	3 1/8	- 1/8	-0.0
O	[illegible] CORP CORP	0- 30	0 3/8	0	0.0
O	COTEC CORP	7- 12	8 1/8	+ 1/8	+1.3
O	[illegible]	0- 30	0 1/8	- 1/8	-2.0
O	COMPUGRAPHIC CORP	20- 30	30 3/4	- 3/4	-2.0
O	COMPUTER TRANSCEIVER	2- 10	1 1/8	0	0.0
O	COMPUTERVISION CORP	20- 30	30	+1 3/8	+3.0
O	CONRAC CORP	11- 24	00	- 1/8	-1.7
O	DATAPRODUCTS CORP	10- 30	10 1/8	0	0.0
O	DATARAM CORP	0- 15	8 3/8	- 3/4	-0.0
O	DATA SWITCH CORP	0- 34	7 1/2	+1	+10.0
O	[illegible] INC	0- 17	8 1/8	+ 1/8	+0.0
O	[illegible] CORP COMPUT	0- 15	11 1/2	- 1/8	-1.0
O	DECVTEL-OLIVETTI	0- 30	4 7/8	+ 1/8	+0.0
O	ELECTRONIC M & O	0- 11	7 1/8	+ 3/8	+0.0
O	[illegible] INC	0- 10	7 3/4	0	0.0
O	EVANS & SUTHERLAND	10- 30	30 1/8	-1 1/4	-7.0
O	[illegible] TECHNOLOGY	0- 14	13 1/2	- 3/8	-0.7
O	GEN'L [illegible] CORP	10- 30	10	+ 7/8	+0.0
O	HAZELTINE CORP	10- 30	30 1/8	+ 3/4	+1.2
O	[illegible] CORP	0- 8	0 3/4	+ 1/8	+0.0
O	INFORMATION INTL INC	20- 20	11	0	0.0
O	INTECOM INC	7- 23	11 1/8	+ 1/8	+0.0
O	INTEL CORP	27- 30	30 1/8	+1 1/8	+0.0
O	LUNDY ELECTRONICS	7- 15	8	0	0.0
O	[illegible] CORP	0- 10	00 4/8	- 1/4	-0.1
O	[illegible] DATA CORP	0- 20	10 3/4	+ 1/8	+2.0
O	[illegible] CORP	10- 30	20 3/8	+ 1/8	+0.0
O	NETWORK SYSTEMS CORP	10- 30	22 1/8	+0 3/8	+11.0
O	[illegible] PHILIPS	30- 30	30	+ 1/8	+1.4
O	NORTHERN TELECOM LTD	30- 30	37 3/8	+1 3/4	+0.0
O	[illegible]	1- 0	1/8	0	0.0
O	[illegible] CORP	11- 30	13 0/8	+ 1/8	+1.0
O	[illegible] CORP	0- 14	13 6/8	+ 7/8	+0.0
N	PLESSEY CO (ADR)	30- 40	30 1/8	-1 1/8	-0.0
O	[illegible] INC	10- 30	00 0/2	-1 1/8	-0.0
O	[illegible] CORP	0- 30	7	+ 1/8	+0.0
O	[illegible] CORP	0- 17	10 7/8	+0 1/2	+0.0
O	[illegible] CORP	10- 00	30 3/4	- 3/4	-0.0
O	[illegible]	30-100	00 3/8	+ 1/8	+0.0
O	[illegible] CORP	1- 0	1/8	0	0.0
O	[illegible] CORP	0- 10	10 3/4	- 1/8	-0.2
O	SCIENTIFIC ATLANTA	0- 00	0	+ 3/8	+0.0
O	[illegible] TECHNOLOGY	0- 30	0	- 3/8	-2.0
O	STORAGE TECHNOLOGY	0- 30	0 3/8	+1	-10.0
O	[illegible]	0- 10	1 7/8	- 1/8	-0.3
O	SYSTEMS & COMP TECH	30- 30	30 1/8	+1 3/8	+0.0
O	T BAR INC	7- 17	0	-1 3/8	-10.0
O	[illegible] PRODUCTS CO	13- 30	10 3/8	-1 3/8	+7.3
O	[illegible] CORP	7- 00	8 0/8	+ 3/4	+0.0
O	[illegible] INC	0- 12	8 7/8	+ 1/2	+0.0
O	TEKTRONIX INC	30- 07	30 0/8	+ 0/8	+1.1
O	TELEX	30- 30	30 1/8	+0	+0.2
O	[illegible] SYSTEMS CO	2- 17	0 3/8	0	0.0
O	[illegible] INC	10- 23	10 1/4	+0 1/8	+10.0
O	[illegible] TECHNOLOGY	2- 30	3 3/8	+ 1/8	+07.0

SUPPLIES & ACCESSORIES

E X C H	Company	1983-84 Range (1)	Close Oct 17 1984	Week Net Change	Week Pct Change
O	AMERICAN BUS PRODS	17- 30	30 3/4	+ 3/8	+1.0
O	[illegible]	30- 30	30 1/8	- 1/8	-0.4
O	DUPLEX PRODUCTS INC	30- 37	30 0/8	- 1/8	-0.0
O	[illegible]	10- 30	32 3/4	+ 1/8	+0.1
O	3M COMPANY	00- 30	70 3/8	+1 3/8	+0.0
O	[illegible] CORP LTD	30- 34	41 3/8	+0 3/8	+0.0
O	STANDARD REGISTER	27- 30	30 3/4	0	0.0
O	WALLACE CORP SERVICE	30- 30	30 1/4	0	0.0

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